The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 13 MARCH 30, 1940. Vol. 52.

GRASS SICKNESS IN HORSES—BIOCHEMICAL INVESTIGATION

JAMES STEWART, W. S. GORDON AND JENNIE WHITELAW McCALLUM

Animal Diseases Research Association,
Moredun Institute, Gilmerton, Edinburgh.

In 1931, Dr. J. Russell Greig, Director of this Institute, initiated a biochemical investigation into grass sickness of horses. From that time until 1935 Dr. Dryerre carried out this work and found that the changes in the constituents of the blood during the course of grass sickness in horses represented a characteristic blood picture. He performed several hundred analyses and found a significant rise in the haemoglobin, inorganic phosphorus and sugar of the blood and a fall in the calcium and chloride contents. Apart from these observations, no attempt had been made to investigate the biochemical aspects of grass sickness.

During the past three years, however, with the establishment in the field of a small laboratory, at which it was possible to carry out blood assays, still better opportunities were available to study thoroughly the biochemical aspects of grass sickness. In addition to the field laboratory stabling was also available to which could be brought horses affected with the disease. This allowed of the animals being kept under the eye of the research workers both night and day and also of the procuring of blood samples at regular intervals throughout the duration of their illness.

By grass sickness in horses is currently understood a relatively afebrile disease characterised by acceleration of the heart rate, complete or partial intestinal stasis and disorder of the functions of the digestive tract, running a course of about one day in peracute attacks and extending, in chronic cases, to months of lingering illness associated with the development of excessive emaciation. The mortality in affected animals is high. A number of experienced clinicians are of opinion that one attack of the disease does not confer immunity, but this will probably remain an open question until the method of diagnosis is placed on a more definite basis than that of an interpretation of clinical symptoms.

The disease occurs in its greatest incidence in the north-eastern, eastern and south-western counties of Scotland. In severely affected areas it has been estimated that the incidence fluctuates from year to year between 2 and 4 per cent. of the total horse population. The increasing number of reports of the occurrence of suspected cases of grass sickness throughout Scotland and England suggests that the disease is widespread in its distribution in these countries though the incidence is very low except in the recognised grass sickness areas.

Grass sickness is primarily a seasonal condition. Cases may occur at any time throughout the year, but the season of greatest incidence is very narrowly defined; 60 to 75 per cent. of the total number of cases each year occur in the month of June which, in affected areas, is the first month in which horses are grazed day and night following upon the winter period of housing and artificial feeding. The disease continues to occur in gradually lessening incidence during July; comparatively few animals become affected in August and September and a small number of cases occur sporadically throughout the remainder of the year.

The cause of the disease has not so far been determined.

Classification of the Four Clinical Types of Grass Sickness

For the purpose of this paper an arbitrary classification of the disease into four clinical types has been adopted, namely, peracute, acute, subacute and chronic. These four types may be regarded as representing differing degrees in the manifestation of one pathological condition. This classification is based on clinical symptoms and duration of illness but it should be stated that every case of grass sickness does not necessarily agree closely with one or other of these types and, further, indefinite illness accompanied by intestinal stasis and running a course of short duration might simulate fairly closely the more acute manifestations of the disease. The clinical symptoms associated with each type of grass sickness may be summarised as follows :—

Peracute Type

Death within approximately 24 hours. Complete cessation of, or very markedly reduced, bowel movement. Accelerated pulse rate which may rise above 100 as death approaches. Temperature variable but no marked tendency to pyrexia. Tympanites of varying degree. Regurgitation of fluid from the stomach in many cases. Periodic salivation usually evident. Food and water refused. Slight abdominal pain may be observed at the onset of the attack and occasionally during the course of illness. Reduction in the secretion of urine. Intermittent and patchy sweating.

Acute Type

Death within approximately four days. Complete or partial cessation of bowel movement. Gradually increasing pulse, 80 to 120. Occasional rise in temperature but no marked tendency to pyrexia. Tympanites of varying degree very frequently present.

Oesophageal spasm and regurgitation of fluid stomach contents from the nostrils. Painful attempts at vomiting. Food refused. Water may be taken but appears to be swallowed with difficulty. Salivation intermittently present and sweating often very marked as death approaches. Reduced secretion of urine in practically all cases. Slight abdominal pain may occasionally occur and a tremor of the muscles of the shoulders and hind quarters is generally observed. Respiration frequently accompanied by slight sighing noise. Conjunctiva congested and icteric.

Subacute Type

Death within approximately 21 days. In this type the animal insidiously passes from an apparently healthy state into a condition of indefinite illness. There is usually dullness and acute abdominal discomfort. The appetite while never in abeyance is poor and capricious. Food is chewed slowly and clumsily and much of it allowed to fall from the mouth. There is some difficulty in swallowing, especially in the case of dry food. Some faeces are passed irregularly; these are usually dry in consistence and small in amount. The pulse rate is generally between 60 and 70. The temperature remains approximately normal. Tremors of the muscles of the shoulder and flank are intermittently present and sometimes very well marked. Snoring respiration often develops at a late stage in the course of the affection. In many cases no urine is passed for relatively prolonged periods; in others, there is a varying degree of difficulty in micturition and in the case of males the penis is often pendulous. Rapid loss of physical condition and marked reduction in the size of the abdomen are outstanding symptoms. The coat becomes dry and the muscles of the neck, back and quarters become atrophied and instead of presenting their normal resilience are hard on palpation. The animal generally adopts a posture in which the hind legs are placed well forward under the body; the back is slightly arched and the tail held tightly into the perineum. Emaciation rapidly develops and after five or six days is very marked; it continues progressively until the occurrence of death.

Chronic Type

Death after 21 days' illness. The symptoms are similar to those of the subacute type but progress more slowly. The emaciation eventually becomes so marked and the abdomen so excessively contracted that the body profile somewhat resembles that of the greyhound. Death eventually occurs from exhaustion. In a proportion of cases the course is protracted over a period of several months. The appetite is capricious, there is foetor oris, snoring respiration, nasal discharge and, in some cases, inflammation and ulceration of the nasal mucosa.

A small percentage of chronic cases recover.

Post-Mortem Examination

In the peracute and acute types autopsy reveals an enormous distension of the stomach, the contents of which are mainly fluid; there is marked increase of fluid in the small intestine and the large bowel is impacted with a mass of hard, dry ingesta. Impaction of the colon is almost constantly present but a few cases have been observed in which, although a diagnosis of grass sickness had been confidently made, the contents of the colon were not impacted. The impacted ingesta are very dry, adherent to the mucous membrane and often covered with a blood-stained dark brown or even black mucous coating. In the course of the general investigation made by this Institute in 1937, a comparison of the volume of the contents of the stomach and small intestine of normal horses killed on account of injury or old age and of horses which were killed while affected with or which died from grass sickness was made. Thus, of 13 normal horses examined, the average volume of the stomach contents was found to be about 7 litres, and that of the small intestine about 9 litres. The same examination of 36 peracute or acute cases of grass sickness provided an average volume figure for the stomach contents of 22 litres and for the small intestine 30 litres. There was also a notable difference in the consistency of the contents. In the normal horses the material in the stomach was of pultaceous or dry consistence and in the small intestine of the consistence of mucus, whereas in the animals affected with grass sickness the contents of the stomach and small intestine were of watery consistence with very little solid matter present.

Congestion of the mucous membrane of varying degree is generally found at different levels of the digestive tract. This is often well marked in the large intestine and the associated lymph glands may be enlarged and haemorrhagic. Sub-serous haemorrhages are generally present, often well marked along the mesenteric vessels and at the junction of the mesentery and intestine. The heart is dilated, its substance softer than normal and haemorrhages in the heart wall, often along the course of the coronary vessels, are generally present. There is usually well-marked subendocardial haemorrhage particularly in the left side of the heart. The liver is frequently pale in appearance, may be larger than normal and the parenchyma is soft and friable. The kidneys are softer than normal and decompose rapidly after death. In the fresh state the cortex has a mottled appearance due to vascular congestion and haemorrhages. The spleen, lymph glands, bladder, thoracic viscera and central nervous system present no constant gross abnormality. Histological examination of tissues from all the organs mentioned has been undertaken by different workers at this Institute between 1922 and 1939, and apart from the occurrence of a deposition of fat in the cells of the liver both around the lobular vein and at the periphery of the lobule and the presence of haemorrhages in the bowel wall and other abdominal viscera, no marked pathological changes were detected.

In subacute and chronic affections the carcase is extremely emaciated. There is considerable enlargement of the spleen and the pulp is of firm consistence. The digestive tract has a shrunken appearance and the volume of the contents is small.

Biochemical Examination of Blood

During the last week of May, 1937, blood samples were obtained from 16 horses affected with grass sickness and the following constituents estimated: sugar, inorganic and total phosphorus, haemoglobin, chlorides, preformed creatinine, amino-nitrogen, non-protein nitrogen, albumin, globulin, fibrin, calcium, magnesium and potassium.

Methods of Analysis

The following methods were adopted in the chemical analysis of the blood: *sugar* by the Folin-Wu

phosphomolybdate method; *calcium* by the Kramer-Tisdall oxalate precipitation and permanganate titration method; *magnesium* by a modification of the Denis method; *globulin*, *albumin* and *fibrin* by the Folin-Wu tyrosine colorimetric method; *potassium* by the Kramer-Tisdall cobalti-nitrite method; *inorganic and total phosphorus* by the Fiske and Subarrow method; *preformed creatinine* by the picric acid colorimetric method; *non-protein-nitrogen* by phosphoric-sulphuric acid digestion followed by the Nesslerization method after Folin and Wu; *amino-nitrogen* by the β-naphthoquinone-sulphonic acid colorimetric method; *chlorides* by a modification of Volhard's method; *haemoglobin* by the acid haematin estimated by a Newcomer glass standard method; *sodium* gravimetrically by means of uranium-zinc-acetate reagent after the method of Butler and Koltoff.

The results of the analysis of the 16 cases are recorded in Table I.

For the purpose of comparison the range of the blood constitutents in normal horses is given. The values for the normal range have been collected over a period of years from horses both at this laboratory and in the field—the criterion of normality being that they showed no clinical symptoms of disease. It would appear that in the case of the horse the normal range for most of the blood constituents is much wider than in other animals.

It will be seen from Table I that of the 14 constituents examined, the majority tended to rise in animals affected with grass sickness. Although in some of the cases little change is observed this may be due to the blood samples being taken very shortly after the first symptoms of the disease were noticeable, since in the case of Nos. 7, 9 and 14, bled within an hour of death, large increases were found. Exceptions to the general rise are the calcium, magnesium, potassium and chloride contents. In the case of the chloride a tendency to fall is apparent since values such as 0·39 and 0·40 per cent. are very low. The calcium content with few exceptions remained at a level well within the normal range. The values for magnesium are mostly within normal range but any changes indicate a slight tendency to rise as seen in Nos. 6, 7 and 13. The blood potassium of No. 9 rose by over 100 per cent., but this was the only rise in blood potassium observed in the 16 cases. The constituents showing the greatest change were sugar, preformed creatinine, haemoglobin, phosphorus and non-protein-nitrogen, but the amino-nitrogen, albumin, globulin and fibrin also showed a slight but definite rise.

In the light of the results of the above preliminary investigation it was decided to obtain serial blood samples at different stages in the course of the disease from as many cases as possible.

In the following descriptions the blood constituents discussed are sugar, haemoglobin, total phosphorus, chlorides, sodium, potassium, calcium, non-protein-nitrogen and amino-nitrogen, since the changes in these constituents were considered to be the most characteristic of the disease. For the purpose of facilitating the presentation of the data block graphs are reproduced in the text showing typical results for the different types of case. Block graphs, although possessing many advantages in graphic representation of blood results possess the great disadvantage of the need to assess a normal for the constituent under consideration. In the present paper these normals, which are the base lines of the graphs, have been kept constant for the five cases discussed, although it will be understood that the normal level of the blood constituents of these horses before the onset of the disease was liable to have varied within the normal range shown in Table I.

TABLE I
(SHOWING CHANGES IN BLOOD CONSTITUENTS IN CASES OF GRASS SICKNESS IN HORSES—VALUES PER 100 C.C. OF BLOOD.)

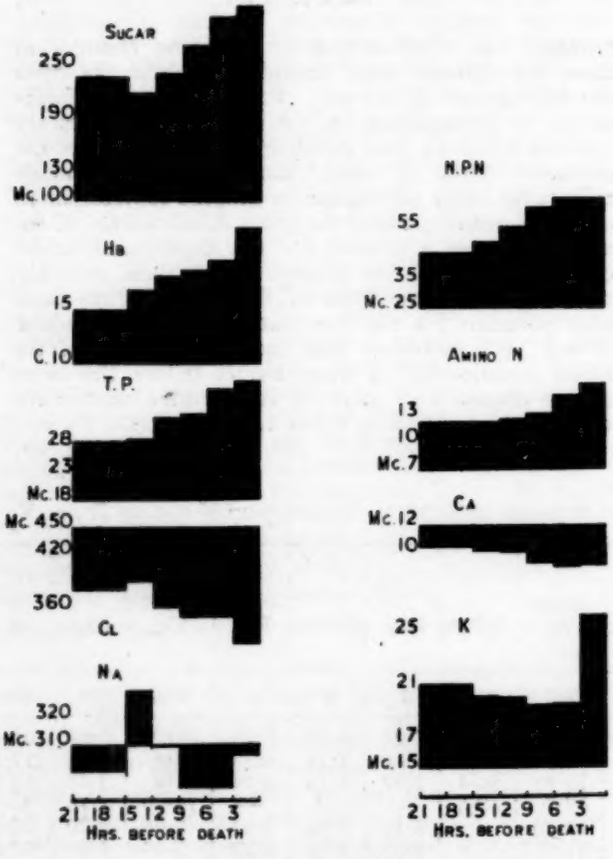
No.	Type of Case.	Sugar.	Inorganic Phosphorus.	Total Phosphorus.	Hb.	Cl.	Creat.	Amino N.	N.P.N	Alb.	Glob.	Fib.	Ca.	Mg.	K.
		mg.	mg.	mg.	g.	g.	mg.	mg.	mg.	g.	g.	g.	mg.	mg.	mg.
1	Acute	97·5	3·98	24·60	13·59	0·47	1·50	8·54	33·7	2·93	4·07	0·39	11·9	1·95	21·6
2	,,	86·3	6·78	18·28	10·30	0·47	1·55	10·38	33·3	2·56	3·71	0·33	12·4	1·95	17·1
3	,,	85·8	5·67	21·65	10·60	0·47	1·46	10·52	36·4	2·87	4·16	0·26	14·0	2·32	19·5
4	,,	95·2	3·29	22·20	11·10	0·48	1·51	12·7	43·5	—	—	—	13·45	1·76	—
5	Subacute	162·6	4·65	21·30	12·0	0·43	1·60	11·83	—	3·12	3·66	0·41	9·95	2·20	15·8
6	,,	72·2	6·90	26·15	14·8	0·45	1·56	11·68	—	3·37	4·14	0·39	7·70	4·89	20·4
7	Peracute	320·0	3·70	27·60	17·2	0·39	—	11·76	61·8	3·29	5·03	0·43	11·60	2·88	14·8
8	Subacute	92·5	3·31	15·69	13·4	0·53	1·58	11·88	36·9	3·37	3·55	0·41	14·7	1·43	17·3
9	Peracute	274·0	6·10	36·05	24·3	0·41	2·07	14·74	71·0	3·44	4·82	0·51	12·0	2·13	41·6
10	Acute	93·5	4·25	22·86	14·6	0·47	1·55	—	39·2	2·90	4·55	0·32	12·1	1·98	15·9
11	,,	84·0	5·10	18·03	10·9	0·47	1·41	10·00	36·6	3·12	4·34	0·40	12·1	1·79	15·2
12	,,	108·8	5·02	21·50	12·3	0·49	1·74	10·61	36·2	3·06	4·65	0·36	11·6	1·99	26·0
13	,,	128·2	5·64	23·26	12·4	0·44	1·65	9·28	38·9	2·90	4·16	0·51	12·2	2·77	15·3
14	,,	184·2	6·24	34·50	19·2	0·40	1·92	—	90·0	—	—	—	10·1	2·49	20·8
15	,,	83·0	4·76	18·10	11·4	0·47	1·48	8·34	30·3	2·94	4·31	0·27	12·8	2·38	17·4
16	,,	162·8	6·24	28·78	16·7	0·41	2·05	—	48·8	3·09	4·44	0·47	11·8	2·07	18·0
	Normal Range	54 — 95	2·2 — 5·6	16·0 — 27·0	8·1 — 11·1	0·43 — 0·50	1·15 — 1·55	5·7 — 12·5	30·0 — 60·0	2·5 — 3·0	3·0 — 4·0	0·25 — 0·40	9·7 — 16·5	1·7 — 3·1	11·7 — 27·4

DESCRIPTION OF RESULTS OF BLOOD ANALYSIS OF THE DIFFERENT TYPES OF CASES.*

Peracute Case

Case A was a typical peracute case, death occurring within 24 hours of its first being noticed ill. At 11 p.m., on June 1st, a few hours after the first symptoms were noticed, the pulse was 108, temperature 103° F., respiration 15 with marked foetor oris present; conjunctiva markedly congested and icteric, salivation, muscular tremors, patchy sweating and tympanites evident; occasional squealing during painful attempts at vomiting but no regurgitation of ingesta. No faeces were passed during the whole duration of the illness. The horse was bled at three-hourly intervals, seven samples in all being obtained, and the results of analysis are shown in diagrammatic form in Fig. 1.

FIG. 1



PERACUTE CASE

*N.B.—During the summers of 1937, 1938 and 1939, more than 200 cases of grass sickness were investigated, clinical symptoms recorded, and blood examinations carried out. It was hoped to publish full records of these cases in this article, but owing to the present war emergency and the need to economise in paper, the Editorial Committee does not see its way to allow of their publication. Under these circumstances, therefore, it has been considered best to discuss fully in this paper a typical case of each type of the disease. Any reader who desires to study the detailed case histories and corresponding blood pictures may obtain them by applying to this Institute.

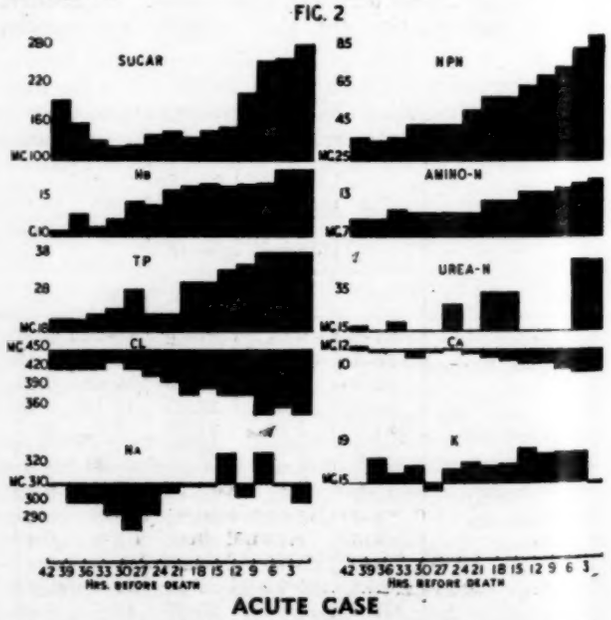
The blood picture shown in Fig. 1 is representative of a peracute case. The sugar rose to 317·4 mg., the non-protein-nitrogen to 71 mg., the amino-nitrogen to 16·5 mg., the total phosphorus to 40 mg., and the haemoglobin to 22·6 grammes per 100 c.c. of blood. The serum calcium fell to 8·9 mg. per 100 c.c. of serum and the blood chlorides to 320 mg. per 100 c.c. of blood. The serum potassium and the serum sodium fluctuated slightly, the potassium rising to 26·3 mg. per 100 c.c. of serum and the sodium remaining fairly constant at approximately 300 mg. per 100 c.c. of serum even at the point of death. It may be mentioned that the mode of the sodium content of the blood of normal horses is from 310 to 320 mg. per 100 c.c. of serum, while the normal range lies between 305 and 340 mg. It will be observed that the increases in sugar and non-protein nitrogen were approximately 200 per cent. whilst that of haemoglobin was 100 per cent. The fall in blood chlorides was not correlated to a corresponding fall in either sodium or potassium.

Acute Case

The acute type of case is more common than the peracute. Case B, a three-year-old Clydesdale gelding, was first observed ill at 10 p.m. on May 28th, and died at 11.30 a.m. on May 31st. Blood samples were taken at three-hourly intervals from 5.55 p.m. on May 29th. When first bled the clinical symptoms were as follows: pulse 112, temperature 101·8° F., respirations 13 with marked foetor oris, posture dull, conjunctiva icteric, patchy sweating with muscular tremor in the shoulder and breast, tympanites present, oesophageal spasms accompanied by squealing, refusal of all food and water.

The analyses of the serial blood samples are shown in Fig. 2.

FIG. 2



ACUTE CASE

It will be seen that, as in the case of the peracute type, the blood sugar rose to nearly 300 mg. per 100 c.c. of blood. In some acute cases examined blood sugars of over 400 mg. have been obtained but a rise of 200 per cent. is very common. Fluctuations may occur, but the rise in blood sugar from the time when the animal is first observed ill until the point of

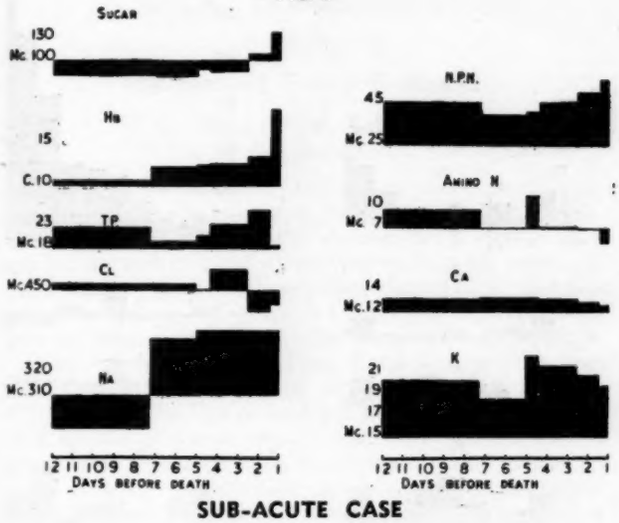
death is usually progressive. The haemoglobin rose from 10·9 grammes to 18·7 grammes per 100 c.c. of blood—an increase of approximately 100 per cent. The rise in haemoglobin is usually more regular than that of sugar which often rises sharply from time to time. There is no obvious correlation between the rise in haemoglobin and that of sugar. The non-protein-nitrogen content of the blood was exceedingly high having risen from 37·5 mg. to 92·0 mg. at the point of death. Changes in the urea-nitrogen and amino-nitrogen contents of the blood are also depicted in Fig. 2. It will be observed that although both these constituents rose in a manner similar to the non-protein-nitrogen content the increases were not strictly proportional since the non-protein-nitrogen increased by 300 per cent., the urea-nitrogen by 200 per cent. and the amino-nitrogen by only 100 per cent. The total increase in non-protein-nitrogen cannot, therefore, be accounted for by a rise in urea. The total phosphorus rose from 21·3 mg. to 38·8 mg. per 100 c.c. of blood. A value of 40 mg. is usual for an acute case of grass sickness at the point of death, although under certain circumstances much higher values have been obtained. The calcium content of the blood serum fell from 12·4 to 10·7 mg. per 100 c.c. of serum. The calcium content of the blood serum very seldom fluctuated beyond the range of normality, although a slight fall within the normal range is usually observed. In exceptional cases a sharp fall to 6 or 7 mg. occurs. The chloride content of the blood fell from 420 mg. to 350 mg. during the course of the illness. This fall in blood chlorides is a characteristic feature of the blood picture of acute cases of grass sickness. The fall in chlorides cannot be correlated with a fall in the sodium content of the blood. It will be seen that a slight fall did occur in the sodium content, but that heavy fluctuations were evident which were not in any manner parallel to the regular fall in chlorides. This fluctuation in the sodium content of the blood is usual in the acute type of the disease. Moreover, the fall in chlorides cannot be related to the behaviour of the potassium content of the blood. The potassium content of the blood showed no tendency to fall below normality. In many cases of grass sickness the potassium content of the blood showed a rise commensurable with that of the sugar and haemoglobin contents.

Sub-acute Case

Case C., a five-year-old Clydesdale gelding, was first observed ill about the beginning of June. By June 13th, when the first blood samples were taken, the clinical symptoms were as follows: pulse 62, temperature 99·2° F., snoring type of respiration had developed, sweating under tail, muscular tremor on shoulder, abdomen very contracted, standing in corner of field for long periods in a listless posture, appetite very capricious. Animal died on the night of June 19th. Analyses of blood samples taken at intervals between June 13th and death are shown in Fig. 3.

The high values obtained for the sugar content of the blood in peracute and acute cases are seldom obtained in subacute cases. A sharp rise in the last few hours before death is usual but the maximum value is rarely above 200 mg. per 100 c.c. of blood. As will be seen from Fig. 3, the sugar content of the blood of Case C. rose to 141·8 mg. Haemoglobin values comparable to that obtained in acute and

FIG. 3



SUB-ACUTE CASE

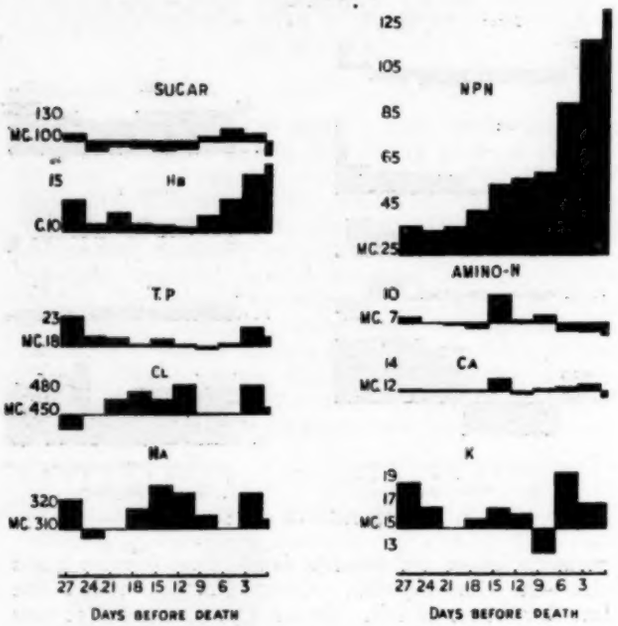
peracute cases are usually found in subacute cases also—the haemoglobin rising sharply within the last few hours of life. In the example given it rose from 13·5 grammes to 19·4 grammes in the course of the last 10 hours before death. The non-protein-nitrogen content of the blood varies considerably in subacute cases—occasionally it rises as high as in acute cases but more often it remains at a lower level. In Case C it rose to 57 mg. In subacute cases it has been found that even while the sugar and haemoglobin levels in the blood had remained unchanged the non-protein-nitrogen had already started to increase. The degree to which the non-protein-nitrogen rises in subacute cases may largely depend on the amount of body wastage which occurs in the course of the illness. It will be observed that the amino-nitrogen showed a tendency to decrease in Case C. The phosphate content of the blood showed little change from normal. In subacute cases the inorganic constituents of the blood, calcium, sodium, potassium and chlorides remain very constant at a normal level. In Case C, the potassium remained constant whilst the sodium showed a slight increase which, however, was not reflected by any change in the chloride content of the blood.

Chronic Case which Died

Case D., a four-year-old Clydesdale gelding, was first observed ill on June 14th, whilst grazing in the field. When first examined on that date, the pulse was 62, temperature 100·6° F., posture alert but very restless, conjunctiva slightly icteric, sweating under tail, muscular tremor on shoulder and quarter, abdomen shrinking but animal eating a little oats and able to swallow. Horse died on the evening of July 8th. Blood samples were taken at regular three-day intervals from the time of onset of illness until death and results of analyses of these samples are depicted in Fig. 4 (*overleaf*).

The most striking blood change in chronic cases which ultimately died was the rise in non-protein-nitrogen, which although usually very high rose in one or two cases to exceptional values. In Case D, it rose to 133·5 mg.—an extremely high level. The sugar content of the blood remained normal, showing slight fluctuations but no sharp rises or falls. The haemoglobin was more liable to change than the

FIG. 4



CHRONIC CASE—FATAL

sugar but the only significant rise occurred in the last few days before death. The other constituents of the blood did not vary outside the normal range for these constituents.

Chronic Case which Recovered

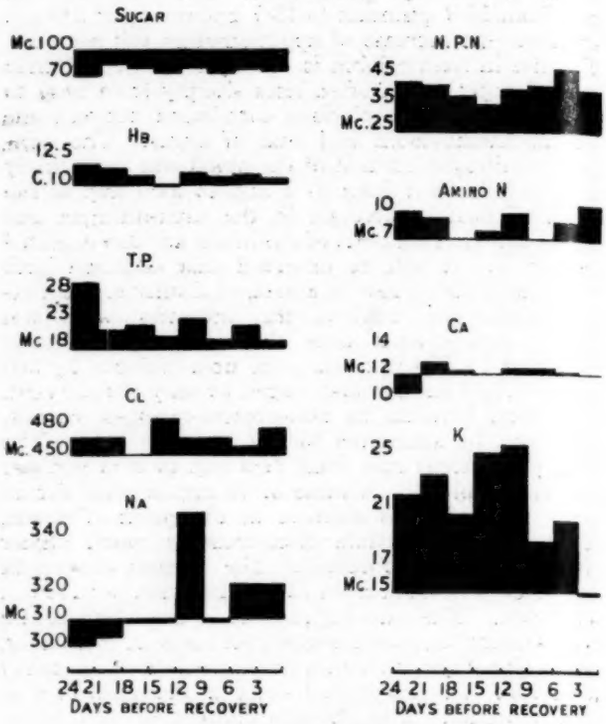
Case E, a four-year-old Clydesdale gelding, was first noticed ill on the morning of June 7th with symptoms of slight colic, some salivation, dullness, pulse 48, temperature 101·4° F., respirations 10, slight sweating under tail, and a poor appetite. During the first few days under examination the animal gradually developed the usual posture and contracted abdomen associated with the typical chronic case. By the end of June the general condition began to improve and the case was discharged on July 2nd. Blood samples were taken at regular intervals and results are shown in Fig. 5.

It will be seen from Fig. 5 that the blood constituents varied only within the normal range. The non-protein-nitrogen never reached a very high figure in Case E, but in several other cases examined it was found that a high non-protein-nitrogen, which was present at the height of the illness, gradually fell as the animal showed signs of recovery. The potassium content of the blood of Case E was higher than that of most cases examined but it remained within the normal range for horses as given in Table I.

DISCUSSION

The blood picture described above in the case of the peracute and acute types of grass sickness resembles that of an acute anhydraemia. In a true anhydraemia large increases in haemoglobin, serum proteins, sugar and non-protein-nitrogen are the principal changes which occur. The inorganic salts of the blood usually show much less change in concentration, being excreted in such amounts as to maintain an approximately normal salt concentration of the plasma even if the dehydration has been brought about quite suddenly. In the peracute and acute types of grass

FIG. 5



CHRONIC CASE—NON-FATAL

sickness, however, neither defaecation nor urination occurs and so the loss of inorganic salts from the body would be at a minimum; nevertheless, there might still be withdrawal from the blood itself. This must take place in the case of the chlorides and calcium. As seen above, the chloride content of the blood may fall considerably. A point of interest is the lack of correlation between the chlorides and sodium, the sodium rarely falling progressively as is the case with the chlorides. Nor can the chloride fall be associated with the potassium ion. The calcium level shows little change during the course of the disease, but a slight loss of calcium from the blood must have taken place, otherwise as the dehydration continued the percentage amount of calcium in the blood would have perceptibly increased. Most probably the body withdraws the calcium from the blood in a manner similar to that which obtains in the withdrawal of chlorides, in an attempt to maintain a normal physiological mechanism despite the acute dehydration. The total and inorganic phosphorus contents of the blood increase after the fashion of the organic constituents. The high non-protein-nitrogen may be explained in part by the functional disturbance of the kidney as a result of dehydration, and in part by the increased destruction of body protein. Emaciation and loss of physical condition in the chronic and subacute cases of the disease represent a marked clinical feature. The high non-protein-nitrogen content found in such cases could be caused wholly by this large destruction of body protein. Further evidence of this is found in the chronic cases which eventually recover since in these the non-protein-nitrogen content of the blood gradually regains a normal value as the physical condition of the animal improves. Perhaps the most striking change in the blood constituents during the course of the disease is the occurrence

of sharp rises in the blood sugar. In an acute anhydraemia a gradual rise in blood sugar would be expected to take place as the dehydration proceeds, but in most of the acute and peracute cases of grass sickness, as the sugar content gradually increases, sharp rises occur with great suddenness. This could be accounted for by glycogenolysis taking place, either because of a liver dysfunction or of a call upon the animals' glycogen reserves. In several acute cases urine samples were obtained which showed a relatively high glucose content, thus confirming the assumption that the blood sugar level was well above the threshold value. Unfortunately it was only in rare cases that urine was obtained since in most instances very little urine was passed after clinical symptoms of the disease had developed, and after death the bladder was generally empty. Further evidence of the severe anhydraemia present in acute cases of the disease was observable in the marked changes which occurred in the physical characters of the blood. As the disease progressed in severity the blood became thick, at times syrupy in consistence, and, since it did not flow readily, blood samples were difficult to obtain. Some idea of the extent of the dehydration of the blood and tissues which is characteristic of the disease is obtained from the figures quoted above which show an increase of 300 per cent. in the volume of liquid in the stomach and small intestine of peracute and acute cases of the disease.

Unless dehydration is brought about very suddenly, such marked changes in the blood as are observed in the peracute and acute types of grass sickness are seldom found since, if the loss of water is more gradual, the physiological mechanism is apparently able to cope with the loss, usually by increasing the volume of fluids ingested. Therefore, as would be expected, the blood changes in subacute and chronic types of grass sickness do not present the severe anhydraemia found in the more acute types but, nevertheless, a certain degree of dehydration might still have occurred in these cases.

It is still doubtful whether the severe intestinal stasis observed in the peracute and acute types can account for all the blood changes or whether another factor is involved. The enormous distension of the stomach with gas and liquid contents is a well-marked feature of the disease but although experiments carried out on dogs have shown that intestinal obstruction can produce a rather similar blood picture, little or no work on these lines has been carried out on horses.

Summary

The clinical, *post-mortem* and blood pictures of peracute, acute, subacute and chronic types of grass sickness in horses are described.

It is concluded that the blood picture of the peracute and acute types resembles that of an anhydraemia.

Acknowledgments.—We are indebted to Dr. J. Russell Greig, Director of the Institute, for much helpful criticism and advice, to the Scottish Board of Research in Veterinary Science for their interest in the work, and to Messrs. D. R. Wilson, B.Sc., M.R.C.V.S., D.V.S.M., and A. W. Taylor, M.R.C.V.S., of the Research Staff of the Institute, for the valuable part they played in the general investigation, and to the many veterinary surgeons and agriculturists whose willing co-operation made this work possible.

CLINICAL COMMUNICATION

Suspected Grass Sickness

E. WALLACE, M.R.C.V.S.
SALISBURY

Three cases which I believe to have been grass sickness were encountered in Hampshire and Wiltshire; in one of them the disease ran a typical subacute course while the other two were acute cases and were rapidly fatal. These cases occurred in October and November, 1939, which I understand is unusually late in the year for this disease to make its appearance.

The subjects of Cases Nos. 1 and 2 were both kept under identical conditions on a downland farm in Wiltshire. The horses had not been stabled since the end of the previous winter and were turned out on permanent pasture which had been used by horses for some years; in addition to whatever grazing was available they received a ration of oats, flaked maize and bran, and clover mixture hay of fairly good quality. Both horses were in regular work.

Case No. 1.

SUBJECT.—Grey cart gelding, six years old, in very good condition.

October 23rd, 1939.—The carter stated that he had noticed that the horse did not seem to be as keen at his work as usual and that he had passed no faeces since early morning, although there had been no signs of colic. He had consequently taken him back to the stable where I saw him about 3 p.m.

SYMPTOMS.—The horse was standing quietly in the stall showing no signs of pain or uneasiness. The temperature was 101° F., pulse strong and normal in frequency. There was complete absence of peristaltic sounds in the abdomen and on rectal examination the contents of those parts of the double colon within reach were very firm to the touch although the bowel did not appear to be unduly packed. The arm on withdrawal was covered with a sticky mucus. The horse was sweating slightly along both flanks and between the thighs.

No satisfactory diagnosis could be arrived at, there being ample evidence of complete bowel stasis but none of the usual symptoms which accompany such a condition.

TREATMENT.—Salt and Istin through the stomach tube.

During that night the horse showed slight uneasiness for a short time but otherwise there was no change and he continued to stand.

October 24th, 1939, *a.m.*—No faeces had been voided and no bowel sounds could be detected. Temperature 102° F. There was slight patchy sweating and the abdomen appeared distended although not unduly tympanitic. 2.30 *p.m.*—The temperature was 103° F. The horse was very uneasy but acute pain was not manifested. There was slight dribbling of saliva from the mouth and for the first time since the commencement of the illness the animal attempted to drink water from a trough in the corner of the straw yard into which he had been moved, but was unable to swallow, the water being returned down the nose. The horse died about 6 p.m. and did not attempt to lie down until the last stages.

POST-MORTEM EXAMINATION.—The stomach contained a quantity of fluid but very little food. The caecal

contents were unusually dry and less than normal in quantity, while those of the large colon were aggregated into large firm mucus-coated balls, the contents of the small colon being similar in appearance. The mucous membranes of the caecum and large colon were slightly congested.

Case No. 2.

SUBJECT.—Grey cart gelding, six years old, in very good condition.

October 24th, 1939.—History the same as that of Case No. 1. Dullness at work and no passage of faeces.

10 *a.m.*—The horse was standing quietly in the stall. Food had been refused, no peristaltic sounds were audible and rectal examination showed a similar state of affairs to Case No. 1. Patchy sweating, particularly over the flanks and shoulders and between the thighs, was noticeable although the weather was cool and the horse had been standing quietly for several hours. Later in the day distinct though momentary choking movements were noticed and there were occasional slight muscular tremors over the shoulder muscles and crural region.

TREATMENT.—Salt by the stomach tube followed later in the day by liquid paraffin.

Faeces were passed after 24 hours but spasms of choking continued and became gradually more intense while muscular tremors were more noticeable. No pain or uneasiness had been shown and the horse did not attempt to lie down ; in fact it did not do so for 14 days and then only for a short time. Until the date of his destruction, one month later, the horse ate very little food and as time went on, attempts at eating provoked more violent spasms of choking. When taken outside he would at first commence to eat grass eagerly but after a few mouthfuls choking would put an end to these attempts.

Condition was gradually lost and he became very tucked-up and " grey-houndish " in appearance. In his box his favourite posture was with the hind feet well forward under the body, the hind quarters resting in the angle of the manger and the wall.

The stomach tube was passed on several occasions and it was noticed that the passing of the tube became progressively more difficult, considerable resistance being experienced to its passage down the oesophagus.

POST-MORTEM EXAMINATION.—Stomach and bowels practically empty and much reduced in volume. The gastric mucosa was slightly congested ; there was moderate congestion of the mucous membranes of the small intestines and marked congestion and corrugation in the caecum and large and small intestines.

Case No. 3.

SUBJECT.—Grey hunter mare, ten years.

November 13th, 1939.—She had been turned out at grass since the beginning of September with other horses and had been brought in because she had been noticed to be dull and not feeding, and the owner thought she had " stoppage."

This mare, when examined about 10 p.m., showed no signs of abdominal pain or uneasiness. The abdomen was full and *per rectum* the bowel contents felt hard but not impacted : the withdrawn arm was mucus-coated. The temperature was 102° F., the pulse was strong and there was a very marked patch of sweating on the back. The stomach tube was passed and a quantity of foul-smelling fluid syphoned off. Salt was then given.

November 14th, 1939.—The temperature was 103°F. ; there was no pain, but the abdomen was very full and there was complete absence of bowel sounds. Slight choking movements were noticed and slight dribbling of saliva from the mouth, but no muscular tremors. Patchy sweating was still in evidence. There had been no passage of faeces. The stomach tube was passed and four or five gallons of foul-smelling fluid were drawn off. The animal died at 10 p.m., having shown slight signs of abdominal pain and uneasiness for the last two or three hours.

POST-MORTEM EXAMINATION.—The stomach was ruptured and this had obviously occurred either immediately before or at the time of death : otherwise the findings were exactly similar to those of Case No. 1.

Remarks

Case No. 1, which had at first sight appeared to be one of impacted bowel, presented several puzzling features which could not be reconciled with such a diagnosis. These were the entire absence of abdominal pain, until the last stages, combined with evidence of complete bowel stasis and patchy sweating for no apparent reason. It was the inability to swallow shown in the later stages which suggested grass sickness and this suspicion was strengthened by the more typical symptoms shown by horse No. 2 on the same day.

It is interesting to note that old hands on this farm recalled similar fatal cases in horses ten or twelve years previously when the farm had been in different ownership.

Case No. 3 presented much the sam train of symptoms as No. 1 but the patchy sweating was much more marked—a regularly outlined patch over the back.

H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

	Price net s. d.	*Post free* s. d.
HOUSE OF COMMONS BILLS (Session 1939-40):		
27. *Agriculture* (Miscellaneous war Provisions). Lords Amendments	0 1	0 1½
STATUTORY RULES AND ORDERS, 1940:		
345. *Animal.* Diseases of Animals. The Warble Fly (Dressing of Cattle) (Amendment) Order, dated March 6th, 1940	0 1	0 1½
SCIENTIFIC AND INDUSTRIAL RESEARCH, DEPARTMENT OF:		
Food Investigation Board. Index to the Literature of Food Investigation. Vol. XI, 3. December, 1939. (47-71-26.)	4 6	4 8

* * * * *

Four ewes belonging to Mr. Joseph Capstick, Ravenstondale, Penrith, were rescued after having been buried in a snowdrift for a month and four days. They were very weak, but recovered under treatment.

THE VETERINARY RECORD

March 30th, 1940.

THE PROFESSION AND THE MINISTRY OF FOOD

UNDER the present strenuous conditions when so much of the profession's time and energy is being devoted to the advancement of such war-time organisation as that of the National A.R.P. for Animals Committee, it is pertinent to review from time to time in what ways the National Veterinary Medical Association is forwarding the more normal interests of the profession.

For the moment its keen interest in the progress of professional education has been brought to a halt, but in other ways its activities have been successfully pursued. Its long-term policy of sound investigation and willing co-operation with the Colonial Office has, after a preliminary disappointment at the outbreak of war, resulted in the Secretary of State for the Colonies accepting in large measure the recommendations put forward by the Association. These negotiations are not yet concluded, but there is every reason to believe that there is likely to be no cause for disagreement between ourselves and the Colonial Office. Likewise, in a similar spirit of co-operation, with the object of furthering both the interests of Government and those of the profession, the Association was able a few weeks ago to persuade the Minister of Agriculture to add a veterinary surgeon to the personnel of the newly-constituted Poultry Advisory Committee. We may confidently anticipate that the good will which has led to both these achievements will operate to the benefit of the bodies concerned.

We are now pleased to inform our readers that there are signs of the development of a similar spirit of co-operation between the Ministry of Food and the profession. Recently, after representations from the Association, a veterinary surgeon was added to the staff of this Ministry. Although this step was cordially welcomed by the Association, in its view much more needs to be done before the unsatisfactory conditions prevailing at present in the inspection of food animals and meat can be considered to be reasonably satisfactory either from the point of view of human health or of public economy.

Our readers will be pleased to learn that a deputation from the Association is shortly to meet representatives of the Ministry of Food in order to discuss the facts and advice contained in the Memorandum which the Association has recently placed before the Minister of Food. It is to be hoped that, following these discussions, the happy relations existing between ourselves and the Ministry of Agriculture, on the one hand, and the Colonial Office on the other, will shortly be followed by an equally generous and willing co-operation with the Ministry of Food.

ABSTRACTS

[INTERNAL STRANGULATION OF THE SMALL INTESTINE IN A HORSE BY THE DEFERENT DUCT. Uberreiter, O. (1939.) *Wien. tierärztl. Mschr.* **26.** 321-324.]

This case is recorded on account of its absolute rarity in horses and relative rarity compared with its occurrence in bovines. The subject was a 7½-year-old gelding which suddenly developed acute colic. The symptoms included acute colic with profuse sweating over all the body, pink mucous membranes, pulse 48—regular and fairly strong—respirations 16 and costo-abdominal, temperature 100° F. and suppressed peristalis. The first rectal examination suggested a diagnosis of obstruction of the colon—the pelvic flexure of the colon was enlarged and obstipated—but suitable treatment failed. Four hours later each of the symptoms recorded above had become more pronounced, and at that stage a successful attempt to diagnose the true cause of the trouble was made. It proved to be strangulation of the small intestine by the left spermatic cord.

Treatment by operation comprised penetration of the abdominal cavity *via* the inguinal canal and severance of the incarcerating cord, which actually consisted of the deferent duct alone ; this had become split off from the rest of the cord. Rapid recovery followed.

J. E.

* * * * *

[METHODS OF OBTAINING SEMEN, ITS EXAMINATION AND ARTIFICAL INSEMINATION IN DOMESTIC ANIMALS. Götze. (1939.) *Deuts. tierärztl. Wschr.* **47.** 194-201.]

A well-illustrated article describing in general terms the various methods of obtaining and examining semen from the various domestic animals. Artificial insemination, its applications and importance in various pathological conditions are also discussed.

A. R.

* * * * *

[THE TRANSFORMATION OF CAROTENE INTO VITAMIN A IN LIVER AUTOLYSATES. Wilson, H. E. C., Ahmad, B., and Mazundar, B. N. (1938.) *Ind. J. Med. Res.* **27.** 1.]

Although there is now little doubt that a transformation of carotene into vitamin A occurs within the body, and that the liver is the organ most intimately concerned, no conclusive demonstration of this function has been possible. Initial experiments with sterile liver autolysis indicate that this is the method of choice for such a demonstration, and that an enzyme is probably responsible for the reaction. There is no evidence that the spleen or kidney plays any active part.

D. D. O.

* * * * *

[BAITLESS FLY-TRAP SCREEN. Derrick, J. D. *Vet. Bull. U.S. Army.* **33.** 294-296 (1 fig.).]

As a means of overcoming some of the objections to the conventional type of fly-trap or screen the author devised baitless types which are described

and illustrated. The traps take the place of windows and the principle of operation is that during the early part of the day the flies settle on an outer screen and go up and down till they find the small openings provided, through which they gain entry, and are caught in the space between the outer and inner screens. During the latter part of the day the process is reversed. Bait is unnecessary since flies already in the trap attract those on the outside. Cleaning of the apparatus is necessary only once a week, and is easily accomplished through the hinged drop-door at the bottom. Flies caught in the trap usually die within 24 to 36 hours.

D. D. O.

REPORT

[**ASSAM.** Report of the Civil Veterinary Department for the Year 1938-39 (Ghose, S.). Assam Government Press, Shillong, annas 7 or 8d.]

The staff consisted of one Director, one Veterinary Investigation Officer, five Veterinary Inspectors, including a temporary appointment of one Johne's Disease Investigation Officer and 63 Veterinary Assistant Surgeons (two temporary). In addition, 43 Veterinary Field Assistants were sanctioned during the year, and placed under training. Additional posts of Veterinary Assistant Surgeons were also sanctioned but, owing to the dearth of qualified candidates, the posts could not be filled.

The year was a very unhealthy one for livestock and rinderpest was responsible for heavy mortality. It is pointed out in the report that unrestricted movement of cattle is a contributory cause and certain executive action was taken to deal with this problem. As a preventive measure goat tissue vaccine was largely employed, no less than 278,812 animals being inoculated. An epidemic of anthrax in cattle and men was satisfactorily brought under control. A serious outbreak of surra in horses was dealt with successfully by curative treatment. No cases of glanders were reported.

The Veterinary Investigation Officer continued his work in connection with a number of diseases and his report was submitted to the Imperial Council of Agricultural Research.

At the Gauhati Laboratory 3,121 specimens were examined microscopically.

There was a considerable increase in the volume of work performed by the staff in the districts. The number of cases treated rose from 306,990 to 470,718 during the year and a large number of bulls was castrated. The staff was also occupied in work connected with the Assam Livestock Association in close co-operation with the livestock section of the Agricultural Department.

The work of the Veterinary Department is developing and appears to be growing in popularity with the agricultural classes.

G. K. W.

Dr Leslie Sheather, Wroxton, Chorleywood, Herts, asks us to state that he would welcome the return to his laboratory of any tubes for blood samples which members of the profession may have lying idle, as replacements are becoming difficult to get.

N.V.M.A. DIVISIONAL REPORT

Lincolnshire and District V.M.A.*

ANNUAL GENERAL MEETING AT GRANTHAM

The annual general meeting of the above Society was held at Grantham on February 8th, 1940.

The President, Mr. J. H. Poles, occupied the Chair. The Society was honoured by the presence of the President of the N.V.M.A., Mr. H. W. Steele-Bodger, and other distinguished visitors including Professor T. Dalling, Miss M. Dalby and Messrs. J. R. B. Hepburn, S. G. Poles, J. Keppie and J. H. Wilkins. The following were also present: Messrs. W. W. Lang, F. L. Gooch (Hon. Associates); Messrs. J. Macdonald, G. Gibson, F. H. Sugden, T. Hicks, G. A. Moore, M. R. MacFarlane, P. E. Emson, R. W. Callaghan and C. Weighton (Members).

The minutes of the last meeting, having been published in the *Veterinary Record*, were taken as read and signed by the President.

Correspondence. — Apologies for absence were received from Messrs. A. N. Foster, C. W. Townsend, R. Swaby, G. Lockwood, R. S. Smyth.

Mr. T. Bindloss wrote tendering his resignation from membership as he was leaving the district. The resignation of Mr. Bindloss, who had been a member for 43 years, was accepted with great regret, and on the proposal of Mr. Hicks, seconded by Mr. Lang, he was unanimously elected an honorary life member.

Treasurer's Report

The report of the Hon. Treasurer (who also presented the balance sheet) for the year ending February 1st, 1940, was as follows:—

During the last year there has been the unusual expense of approximately a two-fifths share of the cost of that much appreciated entertainment provided at the Yarmouth Congress. We have managed to pay this without having to call for any increased subscription.

There is a sum of £9 5s. 6d. to our credit at the bank, and £12 2s. 6d. owing for subscriptions not yet paid.

I think that this year we should renew our donations to the Victoria and the National Benevolent Funds.

In December I was able to send £3 to the Victoria Veterinary Benevolent Fund from their collecting box.

The membership of the Society now is: Honorary Associates 7; Members 43.

In proposing the adoption of the report and the balance sheet Mr. Poles said that the entertainment provided at the Congress was fully appreciated by those present. He was surprised there was such a large amount owing for subscriptions not yet paid, and he hoped members would make an effort to keep their subscriptions paid up to date. Mr. Steele-Bodger said that the entertainment was one of the outstanding successes of the Congress and he was very grateful to the members for it.

It was decided to send donations of £5 each to the Victoria Veterinary Benevolent Fund and the National Veterinary Benevolent and Mutual Defence Society.

Report of Delegate to the Royal Sanitary Institute Congress, 1939.—This was read by Mr. F. L. Gooch who said that he had not been able to attend the Congress personally but that he had been supplied with a detailed account of all that happened. He would

*Received for publication March 5th, 1940.

like to stress the importance of more veterinary surgeons attending these Congresses. Mr. Poles thanked Mr. Gooch for his report and said he was very helpful in attending these congresses and doing these things for the common good.

Election of Officers

President.—On the proposition of Mr. Poles, seconded by Mr. Lang, Mr. T. Hicks was unanimously elected for the coming year.

Vice-Presidents.—As usual the last three Presidents were elected, *viz.*: Mr. J. H. Poles, Mr. A. N. Foster and Mr. C. W. Townsend.

Hon. Secretary and Treasurer.—On the proposition of Mr. Poles, seconded by Mr. Lang, Mr. W. Gibson was again elected.

Mr. W. W. Lang was again elected to represent the Society on the Council of the National Veterinary Medical Association.

Nominations.—The following nominations for membership were made, and will come up for election at the next meeting: Miss M. Dalby, Sleaford (proposed by Mr. T. Hicks; seconded by Mr. F. H. Sugden); Mr. J. R. B. Hepburn, Spalding (proposed by Mr. M. R. MacFarlane; seconded by Mr. R. D. Callaghan); Mr. S. G. Poles, Peterborough (proposed by Mr. W. Gibson; seconded by Mr. T. Hicks).

Air-Raid Protection for Animals

The following paper on the activities of the National A.R.P. for Animals Committee was then read by Professor T. Dalling:

I appreciate very highly the honour your President conferred on me by inviting me to speak to you on the subject of the National A.R.P. for Animals Committee. It may have been somewhat rash of me to have attempted to undertake this task, especially in view of the fact that I can hardly claim a very intimate knowledge of all the working of the organisation. However, I felt I could not refuse your kind invitation, Sir, so here I am to say my bit.

It is unfortunate that illness has prevented Dr. Wooldridge from coming to-day, for in him we have a man who has worked on the National A.R.P. for Animals Committee scheme for some months and who has the whole organisation at his finger tips. However, the President of the National Veterinary Medical Association himself has come and I feel that I cannot do better than deal with the subject in a very general way and leave to him the explanation of the details.

The country is at war—a very different war from that in which many of us took part 25 years ago. This time there is a grave possibility that our own country may be the seat of damage from aerial bombs, fire, gas, etc., which may cause injury to man and animals. When this may happen cannot be within our knowledge but we must be ready to meet it at any time. Veterinary surgeons, especially practitioners, have their part—and a very important part—to play. The National A.R.P. for Animals Committee has prepared plans which will help veterinary practitioners to carry out their job to the fullest extent.

It stands to reason that all parts of the country cannot be expected to adopt the same kind of organisation, for some areas are more vulnerable than others and therefore the risk of attack must be greater. Nevertheless, any district may suffer to some extent and some schemes should, therefore, be in being to deal with the situation if, and when, it arises.

As I see the position, two classes of animals are involved—the dogs and cats and the farm stock. Naturally, in towns, etc., the dogs and cats will be catered for, though horses must not be neglected. The National A.R.P. for Animals Committee organisation for the care of dogs and cats seems to me to be excellent. You remember broadly what is being done—veterinary surgeons and lay people, together with the various Animal Societies, are organising first aid services for the injured. The details vary in different districts but in each case veterinary surgeons are being incorporated in the scheme and they are responding loyally. The registration of dogs and cats, the setting up of units of animal guards, the forming of first aid posts and mobile units, the training, where necessary, of laymen in first aid treatment, etc.—all these matters are being taken very seriously in the towns and in some places plans are nearing the stage of completion. The public is also taking the whole matter seriously and I can assure you they are looking to the veterinary profession for its valuable aid. In some districts the veterinary practitioner is in charge of the whole scheme, though it cannot be expected that this can be the rule everywhere—the job can easily become almost a whole-time one and so long as veterinary surgeons are kept in touch with what is going on and are consulted and give advice which is taken, I feel quite happy about their position in the organisation. In towns, also, provision is being made for the accommodation of horses which may be working on the streets during air raids. It consists in the provision of accommodation, *e.g.* fields, sheds, garages, stables, etc., to which horses can be taken from the streets. In addition to affording some protection for the animals themselves, the object is to get them off the streets so that they will not bolt in all directions, doing damage to the public and blocking the streets and so hindering the passage of essential traffic dealing with fires, human casualties, etc.

In country districts, although some of the precautions taken in towns also apply, it is with farm stock that the veterinary profession must be more concerned. And in this respect two points seem to arise. (1) The part the veterinary surgeon will play on behalf of the owner of the stock and (2) the part he will play in the interest of the general public.

In connection with the first point, the practitioner is dealing with the subject from the point of view of a veterinary surgeon to his client. Should a farm be badly hit and many animals injured, the farmer will naturally, one would expect, send at once for his veterinary surgeon who would carry out the treatment he deems advisable. He will treat the matter, I take it, as he would ordinary cases with the exception that he may be dealing with something concerning which he has had little or no previous experience, *e.g.* gas contamination. He will, one imagines, be taking steps, even now, to acquaint himself with the symptoms of poisoning and contamination with the various types of gases which might be used and the methods of treatment.

In connection with the part the veterinary surgeon will play in dealing with injured livestock in the interest of the general public, the scheme the National A.R.P. for Animals Committee visualises is the organisation of methods for dealing with injured animals and the disposal of injured and dead animals as well as those which may be gas-contaminated. Mobile units seem to be the ideal for these purposes.

The veterinary surgeon is expected to use his skill and knowledge in conserving the carcases of animals for food purposes and on him should rest the responsibility of condemning or passing them. He must be able to advise on the most expedient method of disposing of carcases which he considers unfit for food and on measures to ensure that any gas-contaminated carcases are properly decontaminated before butchers, etc., are allowed to handle them. He should be able to decide on the degree of gas contamination which would still allow a carcase to be used for food and on the measures to be adopted to decontaminate sufficiently to allow the carcase to be dressed with safety.

Each district will necessarily vary in its organisation and the veterinary surgeon must be the key person in all such work.

I do not need to go any further into these matters for I know that Mr. Steele-Bodger will elaborate on the various points and that you have questions in your minds now which you would like to put to him at a later stage.

In conclusion, there are three general points to which I would direct your attention.

(*a*) The scheme is voluntary. As a general rule, I understand, fees for general work are not to be paid except under special circumstances. Mr. Steele-Bodger will, I hope, deal with this point in detail.

(*b*) This is an opportunity for the veterinary profession to use its art and training for the good of the country and to play its part in the time of crisis.

(*c*) Veterinary surgeons, in addition to assisting in formulating plans and schemes in their own districts, should make themselves familiar with the types of injury they are likely to meet and their treatment, especially the various forms of gas contamination.

Owing to the unavoidable absence through illness of Dr. Wooldridge the discussion was opened by Mr. H. W. Steele-Bodger, President of the N.V.M.A.

The President thanked the members for their welcome and expressed his great pleasure at being given the opportunity to visit the Lincolnshire Division, which embraced his native town of Peterborough. With them, he regretted the absence through illness of Dr. Wooldridge and was charged to express to them his (Dr. Wooldridge's) apologies.

[Mr. Steele-Bodger then proceeded to elaborate the work of the National A.R.P. for Animals Committee, giving details both of the technical side and of the registration branch; he feels, however, that as this subject has been, and will again be fully dealt with in these columns by the Chief or Deputy Chief Executive Officer it is unnecessary to publish his remarks *in extenso*.]

A general discussion followed and many doubts and queries were cleared up by the speakers.

Mr. Poles, in proposing a very hearty vote of thanks to the speakers, said he was very sorry that Dr. Wooldridge had been unable to come owing to illness, and he hoped that he would soon make a good recovery. He would like particularly to thank Mr. Steele-Bodger for honouring them with his presence and opening the discussion at such short notice. He wished the speakers to feel that the members appreciated the valuable time and trouble that they had expended in coming to Grantham that afternoon.

In seconding, Mr. Hicks said he felt that all had learnt something of value.

The vote of thanks was heartily endorsed by all present.

Professor Dalling thanked the members for their welcome, and Mr. Steele-Bodger for going into detail. He felt it would be a very good thing if those at headquarters went out now and then and gave such lectures.

Mr. Steele-Bodger thanked the members for their welcome, and said he was very disappointed that they had not had all the information they required owing to many of the pamphlets having gone astray, but Colonel Stordy and Dr. Wooldridge had been working under great difficulties. He advised all members to send in early applications and to address all communications to the proper places. He thought that the scheme provided a golden opportunity for coming into closer association with the National Farmers' Union.

Interesting Cases and Specimens

Mr. MacFarlane brought a large cyst taken from a fat pig that had been killed for home consumption. The pig showed no abnormality during life. Professor Dalling took the specimen and promised to report its nature in the *Record*.

Mr. Steele-Bodger reported that he had removed 121 tape worms from a whippet, and asked if, in the experience of members, such a large number constituted a record.

Mr. Hicks and other members reported that they had had a great deal of trouble with pregnancy toxaemia in ewes. It was said that to keep exercising the sheep was the best treatment.

Mr. Hicks also reported cases of hoose in calves four to twelve weeks old, living on hay and linseed cake. Mr. Steele-Bodger said he had had similar cases and they had responded very well to treatment with sulphonamides.

Retiring President Thanked.—Mr. Lang, in proposing a vote of thanks to the retiring president, said that Mr. Poles had fully justified the members' choice and carried out all the duties in a very capable manner: they remembered, with particular appreciation, how well he took his part at the Yarmouth Congress. Mr. Gooch seconded.

Mr. Poles thanked Mr. Lang and Mr. Gooch for their kind remarks and said he had been very proud to occupy the office for a second time; he also thanked those members who had supported him by attending the meetings, from which all who participated gained so much: all veterinary surgeons should join their local branches and support them by attending their meetings with regularity. He hoped that members would concontinue their support to the new President, Mr. Hicks.

Wm. Gibson, *Hon. Secretary*.

The Destructive Rat.—Rats have no redeeming feature whatsoever. They are not only destructive—metals are about the only substances they do not eat—but they are disease carriers and altogether loathsome. Sir Ralph Glyn mentions that they cause about ten million pounds damage to food. At the beginning of this century fifteen million was a usual estimate. The rat pest was even then recognised as an urgent problem, and it remains so to-day. Successive Boards and Ministries of Agriculture have put up with them. Can our present Ministry afford to entertain them? We think not. When we realise that we have to plough a million acres to supply the food that our rats require the Ministry is neglecting its duty while it continues to tolerate them.—*Farmer and Stock-breeder*.

ROYAL COLLEGE OF VETERINARY SURGEONS

MEMBERSHIP EXAMINATIONS

LIST OF SUCCESSFUL CANDIDATES

Royal Veterinary College
Reading

SECOND YEAR:

Harvey, A. B.
Jukes, A. W.
Laker, H. T. C.

THIRD YEAR:

Boreham, Miss M. J. (P)
Evans, E. T. R.
Hartley, J. C.
Maclean, Brian
O'Connor, T. M. (A)
Purkis, Miss B. M. (P)

(P) denotes credit in Pharmacology.
(A) denotes credit in Anatomy.

FOURTH YEAR:

Davies, W. G.
Goulburn, Miss M. B. A. (P)
Kemp, Miss J. M.
Parker, G. B.
Pritchard, R. W.
Sagredo, Miss M. I. M.
Thompson, J. D. H.

(P) denotes credit in Parasitology.

FINAL YEAR:

Jagger, Miss K. M.

(To be continued.)

IN PARLIAMENT

The Lords and Colonial Development Policy

In the House of Lords on Wednesday of last week LORD SNELL called attention to the recently issued statement of policy on Colonial development and welfare, and to the recommendations of the West Indian Royal Commission, and moved for papers. He said that the documents concerned stood out like a good deed in a naughty world. His desire was that Parliament should take the earliest opportunity of assuring the Colonial Empire that it was behind this statement of policy and that it intended with all convenient speed to apply the principles laid down.

LORD DENMAN said it was right that Palestine and other Mandated Territories should share in the benefits of the proposals which were put forward.

VISCOUNT SWINTON referred to the importance of applying science to the development of agriculture in these Colonies, and of organising marketing. There was a limit to export, and these Colonies, with their growing populations, must depend more and more on the development of local consumption.

VISCOUNT BLEDISLOE urged that part of the new fund should be devoted to the proper training of the chiefs and the maintenance of their influence, particularly in the proper treatment of the land under their control.

LORD MOYNE expressed gratitude, not unmixed with surprise, at the Government's generous measure of acceptance of the recommendations of the West India Royal Commission, especially on welfare services and the provision of research. The decision of the Government was a very effective answer to the taunts made at the time the Commission was appointed that it was appointed in order that these problems might be shelved.

VISCOUNT TRENCHARD said that the heads of businesses connected with the Colonies were as keen as anybody to co-operate with the Government in improving conditions. Development was the keynote of the matter. He hoped that the education scheme would not only turn out Government clerks, but that every effort would be made to turn out men who would know what agriculture was, and had learned a trade.

LORD STONEHAVEN said that he was particularly interested in what the White Paper implied. He thought it destroyed for ever the nightmare that one day we might find that the Government were going to hand over the Colonies to some international organisation under an extension of the mandatory system. We could no more divest ourselves of our responsibility in respect of the peoples of the Colonies than a man could divest himself of his responsibility to maintain and care for his own children.

LORD BARNBY said that the redistribution of population would become an essential problem after the war.

LORD BEAVERBROOK suggested the development of an air service to the West Indies.

GOVERNMENT REPLY

The MARQUESS OF DUFFERIN AND AVA, Parliamentary Under-Secretary for the Colonies, said that all the suggestions made would be carefully borne in mind. He reminded their lordships that, although this policy was to some extent a development of what had gone before, in fact it was a very considerable change.

They had asked the Colonies to prepare their schemes in the hope that Parliament would approve the Act. They were already setting up the necessary machinery in the Colonies to devise proper schemes to be set before the new Committee when it came into existence. In the meanwhile the Colonial Office were taking certain other steps to equip themselves and the Colonies for the new developments.

The motion was, by leave, withdrawn.

. . . . . .

The following were among the questions and answers recorded in the House of Commons prior to the Easter Recess:—

SCOTLAND (AGRICULTURE, CREDIT FACILITIES)

Sir R. W. SMITH asked the Secretary of State for Scotland what arrangements he proposes in connection with increased production for extended credit facilities for farmers in Scotland?

Mr. COLVILLE: I am assured that the Scottish banks are in close and sympathetic touch with the Scottish farmers and that, in general, there will be no difficulty in farmers, whose financial position is reasonably satisfactory, obtaining adequate credit to enable them to play their full part in the programme of increased food production. I recognise, however, that there may be a minority of farmers who find themselves in some particular difficulty in regard to the supply of materials and services for increased production, and I have been in consultation with the banks and have arranged with them that they will, on application, make special arrangements for dealing with such cases, and wherever possible will make the necessary advances. Farmers who require such special facilities in order to enable them to carry out the instructions of the Agricultural Executive Committees should accordingly apply to a bank, which in the case of farmers having a banking connection should be the bank with which they have been in the habit of dealing. I should like to say that I am very much indebted to the Scottish banks for their ready co-operation in this arrangement which will ensure that the necessary credits will be made available to farmers who need them with a minimum of delay.

. . . . . .

CREDIT FACILITIES

Mr. DE LA BERE asked the Minister of Agriculture whether he will take steps to make use of existing 7,000 branches of the joint stock banks, with a view to the formation of an agricultural farm credit bureau, restricted under its constitution from charging more than 1 per cent. above the current Bank rate on all its transactions?

THE MINISTER OF AGRICULTURE (COLONEL SIR REGINALD DORMAN-SMITH: I cannot adopt my hon. Friend's proposal. As my hon. Friend is aware, I have no power

to use the joint stock banks, which are private institutions, in the manner suggested.

Mr. De la Bere: Will my right hon. and gallant Friend awaken the Government to the need in this matter of more generous treatment; is he aware that, with a 2 per cent. Bank rate, charging 5 per cent. is indefensible, and has it not been three years since I first asked him to take some action in this matter? If he has no power, will he consult the Lord Privy Seal?

. . . . . .

Horse Breeding

Mr. Jackson asked the Minister of Agriculture whether he is aware that the Builth and Radnorshire Shire Horse Society will probably be unable to continue its activities during the 1940 season without the assistance which it has received during the past years from the grants made by his Department; and whether, in view of the desirability of maintaining so far as possible the breeding of heavy horses by farmers in Wales, he will examine the financial circumstances of the horse societies at an early date with a view to ascertaining what is the minimum financial support necessary to enable them to continue their useful activities?

Sir R. Dorman-Smith: I have received representations in the sense indicated by the hon. Member in the first part of the Question. With regard to the latter part, I would refer him to the replies given on March 14th to my hon. and gallant Friend the Member for South Portsmouth (Sir J. Lucas) and my hon. Friend the Member for Gillingham (Sir R. Gower).

Major Carver asked the Minister of Agriculture whether he is aware that the war agricultural executive committee of the East Riding of Yorkshire is supporting the protests of the Shire Horse Society against his recent decision to discontinue the grants for heavy-horse breeding; and whether, in view of the widespread protests which this decision has caused in all agricultural circles, he can arrange for the whole matter to be reinvestigated at an early date?

Sir R. Dorman-Smith: I would refer my hon. and gallant Friend to the replies given to my hon. and gallant Friend the Member for South Portsmouth (Sir J. Lucas) and my hon. Friend the Member for Gillingham (Sir R. Gower) on March 14th.

[All the earlier replies to which the Minister referred were in the nature of a refusal to reinstate the horse-breeding grants.—*Editor.*]

Major Sir Jocelyn Lucas asked the Minister of Agriculture, in connection with the grant to heavy-horse breeding, the number of stallions in use and the number of mares served during the past three seasons; and whether he has formed any estimate of the reduction in the number of mares which will be served if the decision to withdraw the heavy-horse grant is proceeded with?

Sir R. Dorman-Smith: The number of stallions hired by heavy-horse societies in receipt of grants in respect of the 1937, 1938 and 1939 seasons was 200, 212 and 204, respectively; and the number of mares served was 19,323, 19,492 and 16,953, respectively. With regard to the last part of the Question, I would refer my hon. and gallant Friend to the reply given to him on March 14th.

Sir J. Lucas: In view of the very small amount of money involved, can the right hon. and gallant Gentleman say that this grant will not be withdrawn?

Sir R. Dorman-Smith: No, Sir, I am afraid I cannot.

. . . . . .

Horses

Sir J. Lucas asked the Minister of Transport whether, in view of the desirability of economising in petrol as far as possible, he will consult with the Minister of Agriculture as to the adequacy of present supplies of horses for transport in this country, and as to the desirability of maintaining a sufficient supply of horses for this purpose?

Mr. Bernays: I have no evidence of any serious shortage of horses for transport, and I would remind my hon. and gallant Friend that the purposes for which horses can usefully be substituted for motor transport are limited and are not those which make the heaviest demands for liquid fuel. Any substantial increase in the number of horses available for transport in the near future would involve importation of horses and an increased demand for feeding stuffs.

. . . . . .

Meat

Major Mills asked the Minister of Food whether he will take steps to ensure that only meat fit for human consumption is sent out from Government-controlled slaughterhouses; whether he will satisfy himself that the methods of handling the meat in the course of its distribution to retail shops are reasonably cleanly; whether his attention has been called to a particular case of the supply of meat considered unfit for human consumption to a firm of butchers at Fordingbridge, Hants; and what steps he proposes to take to prevent such occurrences in future?

Mr. W. S. Morrison: The co-operation of the local authorities, whose duty it is to ensure the healthy state of meat available for human food, has been encouraged and I am satisfied that the methods of handling the meat in the course of its distribution to retail shops are reasonably satisfactory. As regards the third part of the Question my attention has been directed to the case at Fordingbridge, where a small quantity of meat was condemned by the local sanitary authority as being unfit for human consumption. As regards the last part of the Question, it should be explained that even in peace-time condemnations of meat occur and it is then as now the duty of the local authorities to see that meat unfit for human consumption does not pass into consumption. I am watching the position closely and shall take such action as appears necessary in consultation with my right hon. Friends the Minister of Health and the Secretary of State for Scotland.

. . . . . .

Pigs (Marking)

Mr. Harvey asked the Parliamentary Secretary to the Ministry of Food if he would expedite the introduction of some less cruel method of marking pigs than that of puncturing their ears.

Mr. Lennox-Boyd: I think the outcry is very considerably exaggerated.

Mr. Lipson: Is the Minister aware that a previous answer on this question caused widespread indignation and further questions were put down to try to persuade him to change his attitude and adopt some other method?

Mr. Lennox-Boyd: I think the indignation was based on insufficient knowledge.

. . . . . .

Feeding Stuffs

Lieut.-Colonel Sir Thomas Moore asked the Minister of Agriculture whether he is yet able to form any estimate of the amount of feeding stuffs which should be available for farmers during the next 12 months; whether he anticipates any shortage of supplies as compared with the immediate pre-war period; and what steps he is taking to encourage farmers to grow crops which will provide them with adequate substitutes?

Sir R. Dorman-Smith: I am unable to give any estimate of the quantities of animal feeding stuffs that will be available during the next 12 months, but owing to other demands upon the limited shipping space available, I anticipate that the aggregate quantity imported will continue to be appreciably below the pre-war level. As regards the last part of the Question, I have, since the outbreak of war, constantly impressed upon farmers that, in their own interest, they should make every effort to grow a larger proportion of their own feeding-stuff requirements, and county war agricultural executive committees have been given a wide latitude in approving crops for the purposes of the grant for ploughing-up.

Waste Products (Feeding Stuffs)

Lieut.-Colonel Heneage asked the Minister of Agriculture what steps are being taken in the neighbourhood of Lincoln City to call the attention of farmers to the advisability of using waste products suitable for feeding pigs and poultry and manures which can be obtained from city waste; and whether he will further state what steps are being taken to point out to the farmers that they should make use of these substances when ordinary feeding stuffs are not available?

Sir R. Dorman-Smith: The attention of farmers generally has been drawn to the use of waste food stuffs for stock feeding through the normal means of publicity, including a leaflet on pig keeping in war-time which has been widely distributed. As explained in reply to my hon. Friend on Thursday last, I have asked the county war agricultural executive committees to co-operate with local authorities in the disposal of waste food stuffs from their areas. A leaflet on the use of urban waste materials for fertilising purposes is in preparation, and will, I hope, be ready shortly.

Mr. R. C. Morrison: When will the Department make a serious effort to organise the distribution of this waste feeding stuff instead of sending a circular letter? It requires more than that.

Sir R. Dorman-Smith: It requires the education of the farmers in the use of this particular food, which they have not been accustomed to using before, and we are trying to create a demand by educating them.

Lieut.-Colonel Heneage: May I ask whether my right hon. and gallant Friend is satisfied about the position around Lincoln in regard to feeding stuffs? Farmers are saying that they have not enough feeding stuffs, and the borough council are not doing anything because they say there is no demand.

Mr. Liddall: Is my right hon. and gallant Friend aware that every farmer around the city of Lincoln appreciates the value of the waste feeding stuffs and will be only too glad to avail himself of every ounce of the feeding stuff when transport facilities are available?

Sir R. Dorman-Smith: Yes, Sir, I think that is the case. I would also like to warn the House that we have to take some care in regard to these waste products, because animal diseases can easily come about.

Lieut.-Colonel Heneage asked the Minister of Supply how the process of drying swill or refuse, suitable for livestock, is proceeding among the local authorities, having in view the advent of the hot weather?

The Minister of Supply (Mr. Burgin): So far as I am aware, Tottenham is the only council which up to the present has under consideration the provision of a special plant for drying stock-feeding stuffs. I understand that my right hon. Friend the Minister of Health has recently sanctioned a loan for this purpose. I have sent a circular letter to all local authorities on the question of the collection of waste food stuffs for pig and poultry feeding, and my right hon. and gallant Friend the Minister of Agriculture has asked county war agricultural executive committees to collaborate with local authorities and inform them where a demand for such waste food stuffs exists. Where the demand would warrant the provision of a drying plant, I have no doubt that the matter would be considered by the local authorities concerned.

. . . . .

Poultry Feeding Stuffs

Mr. De la Bere asked the Minister of Food whether he will arrange for an additional release of imported wheat for the poultry-rearers for the period of the hatching season for young chicks to the middle of May, and also ensure that some cut wheat is available for the young chicks during this period, in view of the importance of maintaining the poultry-flocks throughout the country as far as possible?

Mr. Lennox-Boyd: The increase from 33 per cent. to 50 per cent. in the provision of home-grown wheat that may be sold for feeding livestock, which my right hon. Friend announced in the House on March 13th, will, it is estimated, increase the supply of feeding wheat during April by about 40,000 tons. In addition, the quantity of imported cereal feeding stuffs being released at the ports during the month of March includes 40,000 tons of feeding wheat.

Mr. De la Bere: Will this enable some extra supplies to be available for these young chicks? Does my hon. Friend not realise that it is very important to help the poultry industry during the coming two months, after which it will be better able to look after itself?

Mr. Lennox-Boyd: Certainly, we realise the importance of attending to the industry during these two months, and we shall do our best to see that additional supplies are available.

Mr. T. Williams: Has any appeal been made to dealers to see that extra supplies are given during this period, where possible?

Mr. Lennox-Boyd: We have that matter under consideration.

. . . . .

Agriculture (Grassland Ploughing)

Lieut.-Colonel Heneage asked the Minister of Agriculture whether, in view of difficulties which farmers have experienced in carrying out ploughing operations under the unfavourable weather conditions of the past winter, it is proposed to extend the period during which the ploughing grants of £2 per acre are payable?

Sir R. Dorman-Smith: Yes, Sir. In view of the difficulties to which my hon. Friend refers, the Government have decided to extend the grant period from March 31st to April 30th, so as to enable farmers to carry out the programme of grassland ploughing in the United Kingdom for the 1940 harvest, which, but for weather conditions, would have been completed by March 31st. The extension will also apply to grasslands of one acre or more broken up for allotments.

There will also be a special extension to May 15th, 1940, to enable additional grasslands to be ploughed up for the cultivation this year of root and fodder crops. Steps will be taken to ensure that the grant is not paid in respect of lands which could reasonably have been ploughed before April 30th.

An announcement will be made later concerning the ploughing up of grassland for the 1941 harvest. In the meantime, the extension to May 15th will, of course, apply to cases where, with the approval of the County War Executive Agricultural Committee, seven year grasslands are broken up for re-seeding to grass or for summer fallowing (or sowing to an approved catch crop) in preparation for a crop for the 1941 harvest.

. . . . .

Children (Milk Supply)

Mr. R. Morgan asked the Minister of Health whether, as the Ministry's Circular No. 1840 provides that the quality of milk supplied for young children and infants shall be approved by the medical officer of health, he can give an assurance that medical officers will not approve any milk supplied under this scheme for young children that cannot be certified to be entirely free of tubercle and other harmful bacilli?

Mr. Elliot: I am confident that medical officers of health, who have had much experience in this matter, are fully aware of the desirability of ensuring that milk supplied to infants and young children shall be safe.

If experiments now being carried out in Hull and Grimsby fish meal factories are successful, large supplies of potato meal will become available as feeding stuffs for farmers in Great Britain. A start was made some time ago when 100 tons of second-grade potatoes were sent from Yorkshire to two fish meal factories, one in Hull and one in Grimsby, for making into potato meal. These first experiments showed that the plan was a feasible one after slight adjustments to plant and methods of working.—*Farmers' Weekly.*

NOTES AND NEWS

Diary of Events

April 1st.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.
April 1st.—R.C.V.S. Annual Fees due.
April 4th.—Meeting of the Central Division, N.V.M.A., Conway Hall, W.C.1, 2.30 p.m.
April 5th—Annual General Meeting of the Society of Veterinary Practitioners (Division of the N.V.M.A.) at Birmingham, 2.15 p.m.
April 8th.—N.V.M.A. Committee Meetings.
April 9th.—N.V.M.A. **Council** and Committee Meetings.
May 9th.—Last date for nominations, R.C.V.S. Council Election.
May 14th.—Provisional date for commencement of R.C.V.S. Animal Management Examination.
May 23rd.—Issue of R.C.V.S. Annual Report and Voting Papers.
May 30th.—Last date for receipt of R.C.V.S. Council Election Voting Papers.
June 6th.—**R.C.V.S. Annual General Meeting.**
Victoria Veterinary Benevolent Fund Annual General Meeting.
June 27th.—R.C.V.S. Written Examinations begin.
July 3rd.—Provisional date for commencement of R.C.V.S. Oral and Practical Examinations.

* * * * *

The Veterinary Profession and Military Service

As was reported in our issue of February 3rd, discussion took place at the last meeting of the Council of the National Veterinary Medical Association concerning the position of veterinary surgeons who desired to offer their services in His Majesty's Forces in a non-veterinary capacity.

As the result of conversations which subsequently took place between the representatives of the National Veterinary Medical Association, the Royal College of Veterinary Surgeons, and the Ministry of Agriculture, it was agreed that it was undesirable at the present juncture to ask the Minister of Labour to make any general amendment to the existing reservation, but we are informed that if one of the branches of the Armed Forces desires to make application for the services of a particular veterinary surgeon for employment other than in his professional capacity there is a procedure whereby sanction for such recruitment can be given on the application by the Service Department concerned. A veterinary surgeon; therefore, wishing to join the Armed Forces under these conditions must get the commanding officer of the unit which he desires to join to make application for his services.

* * * * *

National A.R.P. Animals Committee

Veterinary surgeons who are assisting the above committee are requested to inform headquarters (36, Gordon Square, W.C.1) of any change of address, as omission to do so leads to difficulties in the issue of equipment and in other directions.

* * * * *

GENERAL OBITUARY

Patrick Playfair Laidlaw

With deep regret we record the death of Sir Patrick Laidlaw which took place with unexpected suddenness on March 19th last at his residence in Golder's Green.

The tragedy which has thus fallen on the research world and the sorrow which will be felt by all his colleagues at his untimely death will be shared by his many friends in the veterinary profession, for he was almost as well known to us, by repute if not in person, as to his more intimate acquaintances. His name first came before the veterinary profession in connection with his investigations into the cause and prevention of dog distemper which he carried out in collaboration with Mr. G. W. Dunkin in the years following 1923, which marked the birth of the "Field" Distemper Fund. It is in that connection that his name will be remembered by general practitioners, many of whom he came to know personally. His eminence as a research worker was, however, well known long before that time and his publications were recognised as classics in the subjects on which he had worked. In this connection it may be said that one of his most outstanding characteristics, apart from his charm of manner and extreme modesty, was his lucidity of expression. It was never possible to misunderstand him and the immense care which he always took when writing reports of his observations, his strict attention to even the smallest detail is a testimony to the thoroughness with which he attacked every problem which came his way. He was never guilty of ambiguity whether in speech or writing, and he loathed all kinds of pretence or sham.

There are many living to-day, especially members of the younger generation of research workers, who have reason to be grateful to him, for he was the most approachable of men and was always willing to come to the assistance of any who had encountered difficulties. His fine analytical mind and the conciseness with which he invariably expressed himself made him an admirable colleague.

His published works are numerous and cover a multitude of scientific subjects, but in later years his interest was towards the virus group of organisms. Together with his colleagues, C. H. Andrewes, Wilson Smith and Stuart Harris, he will always be associated with the investigations into human influenza in much the same way as is the case with dog distemper.

His publications are only a small indication of his worth and prowess as a research worker, for there are many others in which his name never appeared with which he was in no small way concerned.

Honours were showered on him in his later years. In 1927 he was admitted to the Royal Society and he received the Royal Medal of that Society in 1933. In 1935 he was knighted.

His contact with the veterinary profession through his enquiries into dog distemper, aroused his interest in animal diseases. He showed a keen appreciation of the progress of young veterinary research workers and continually encouraged a closer alliance between the two professions. It is not surprising, therefore, that he became a member of the Animal Diseases Committee of the Agricultural Research Council and the Foot-and-Mouth Disease Research Committee, where his sound advice was much valued.

The veterinary profession recognised its appreciation of his work and he was elected Hon. Fellow of the Central Veterinary Society, the Royal Counties Veterinary Medical Association and of the Veterinary Research Club. He spoke at meetings of all of them, but he was a regular attendant of the Club meetings where he took much pleasure in talking with our men both in debate and privately. In 1931 he was elected Hon. Life Fellow of the New York Veterinary Medical Society and it is with gratitude that we recall the affectionate regard in which he was held in the United States. Many tributes to his work and personality were made on the occasion of his election. The Kennel Club elected him an Hon. Life Member for his work on dog distemper.

And so the veterinary profession has lost yet another medical friend; one whom it seems impossible to replace. There will be widespread sorrow at the untimely passing of a kindly, courteous gentleman.

G. W. D.

* * * * *

R.C.V.S. OBITUARY

Reid, David Murdoch, 12, Martin Street, Maryfield, Dundee. Graduated Edinburgh, March 31st, 1896. Died March 21st, 1940; aged 71 years.

Mr. David M. Reid, M.R.C.V.S.

Mr. David Murdoch Reid, whose death we record with much regret, was formerly a well-known practitioner in Auchtermuchty, of which town he was a native.

While in Auchtermuchty he helped his father, also a veterinary surgeon, for a number of years, and on his father's retirement he carried on the business alone.

About 25 years ago he went to Glasgow for a short time. He later turned his attention to farming, and took over North Powrie Farm, Forfar Road, By Dundee.

Mr. Reid was a keen sportsman, being a member of Arbroath bowling rink which won the Fife Cup for the first time in 1909. His other sport was shooting, and he was a first-class shot.

He is survived by his wife and three daughters.

The funeral took place at Auchtermuchty Cemetery on March 23rd, Major Andrew Spreull, D.S.O., T.D., of Dundee, representing Mr. Reid's colleagues of the veterinary profession.

* * * * *

The Late Mr. Walter Packman, M.R.C.V.S.

In reference to the late Mr. Walter Packman, M.R.C.V.S., of Bury, we reproduce, further to the account in our last issue, the following passages from the *Bury Times*:

"A native of Canterbury, he came to Bury almost 60 years ago, became assistant to the late Mr. Tom Briggs, the then leading veterinary surgeon in Bury, and the two went into partnership in 1892. In the following year Mr. Briggs died and his partner carried on the business with which he was actively engaged up to within a few weeks of his death.

Mr. Packman graduated at the Glasgow Veterinary College and for two years was president of the Lancashire Veterinary Medical Association, also being, for a number of years, a member of the Council of the Royal College of Veterinary Surgeons in London. He was perhaps the oldest practising veterinary surgeon in Lancashire, and had been hon. veterinary surgeon of the Royal Lancashire Agricultural Show for upwards of 30 years.

"A prominent freemason, he was a past master of the St. John Lodge, Prince of Wales Lodge and Fortitude Lodge, and a past provincial grand senior warden for East Lancashire. Before the Great War Mr. Packman had been prominently identified with the Bury Parish Church. He was a past president of the Palatine Club, Bury. For 30 years he had been a director of the New Victoria Cotton Spinning and Manufacturing Co., Ltd., Bury. His wife, formerly a Miss Booth, youngest daughter of the late Mr. R. Booth, cotton spinner, of Radcliffe, died in October, 1903, and he is survived by two sons."

The Funeral

Masonic brethren and friends gathered for the funeral service in the Parish Church on March 11th. The Rector (Canon Hornby) officiated at the Church and later at the interment at Bury Cemetery, assisted by the Rev. R. G. Norburn.

Organisations and institutions represented were: Royal Lancashire Show; New Victoria Cotton Spinning and Manufacturing Co., Ltd.; Parish Church wardens; Palatine Club; Westminster Bank, Ltd.; Barclays Bank, Ltd.; Earl of Lathom Lodge; Prince of Wales Lodge; Relief Lodge; Watson and Chell; Fredk. Howarth, Son, and Maitland; C. M. Merchant and Son.

Among those present at the Church were: The Mayor, Alderman P. Stock, Mr. H. Moscrop Robinson (representing Mr. A. Redford, Kingston Hall, Surrey), Councillor F. Smith, Mr. R. Moore (Town Clerk), and several members of the veterinary profession.

* * * * *

PERSONAL

Birth.—McLauchlan.—At Dorchester, on March 14th, 1940, to Betty, wife of J. D. McLauchlan, M.R.C.V.S., D.V.S.M., a son.

* * * * *

REGISTER OF VETERINARY SURGEONS

The new Register for 1940 has just been printed. On account of the war the contents have been limited to the lists of officials and members of Council of the College, and the Register of Members with the geographical lists.

The number of Members registered is 3,722, which is an increase of 63 on the previous Register. The number of deaths recorded during the year was 93, and 12 names were removed for other reasons. The number of new graduates was 165, and 3 names of Members were restored to the Register. The number of persons registered under the 1881 Act as "Existing Practitioners" is now 10.

* * * * *

STRICTER MEAT INSPECTION FOR PORTSMOUTH

A scheme for a stricter control of meat offered for sale was placed before Portsmouth City Council on March 12th, when the Special Committee as to the Constitution of Committees reported that they had decided to postpone any general scheme of reorganisation of part II of the medical services until after the war, but made recommendations on matters which they considered it would be inadvisable to allow to remain in abeyance.

Among these recommendations was that of the appointment of Mr. R. Scoular, M.R.C.V.S., the present meat inspector, as Veterinary Officer to the Corporation, in the place of Mr. H. Green, who is due to retire, and that Mr. Scoular be also appointed Superintendent of the Public Abattoir, at an inclusive salary of £600, including car allowance, this being the minimum according to the scale of the National Veterinary Medical Association.

Councillor Sharman opposed the appointment of Mr. Scoular. The veterinary work of the Corporation was very small indeed, and he did not think it was justified at the present time. He moved an amendment that this matter be referred back to the Committee for further consideration.

Councillor Wallis seconded.

Councillor Lane, replying to the discussion, said that the recommendation would give a fully qualified official greater powers to carry out his duties as meat inspector. It would also lead to stricter and better control of the meat sales of Portsmouth.

The amendment was lost and the recommendation adopted.

* * * * *

LIVERPOOL DEGREE EXAMINATIONS

The following is the University of Liverpool, School of Veterinary Science, Examination List for March, 1940, in connection with the University Degree of B.V.Sc.:—

Degree of B.V.Sc.

Final Examination.—*Part I*: Carr, W. H., Hornby, R. B., Smallwood, Ethel. *Part II*: Carr, W. H., Hornby, R. B., Smallwood, Ethel.

Second Examination.—Edwards, A. M., Smith, B.

* * * * *

HORSE GRANT SUSPENSION PROTEST

Strong protests were made at the annual meeting in London of the Shire Horse Society against the decision of the Ministry of Agricultrue at the outbreak of war to suspend payment of grants for heavy horse breeding. This measure was described as short-sighted and likely to lead to a decline in heavy horse breeding.

Mr. W. J. Cumber, President of the Council of the Society, said that if the Government were anxious to cultivate another two million acres, the Shire horse would be needed. "Many of us are grateful for the use we get out of tractors," he said, "but there is a considerable quantity of land which only a horse can plough, and it is this land which needs ploughing most."

Sir Walter Gilbey proposed that a new protest should be sent to the Minister of Agriculture, and it was decided that the President, President-elect and Council should remain in office during the war.

The 1940 London Show, it was announced, has been abandoned.

* * * * *

CLYDESDALE HORSES

"Despite increasing mechanisation of the farm, the Clydesdale horse is going stronger than it has been for a few years. Increased production means the utilisation of greater horse power," writes "Benachie" in *Farming News*. "And again the breed is making remarkable headway in many parts of Ireland and in the north and other areas of England. The brisk demand for the hiring of stallions at Glasgow Show was another indication of a distinct interest in the revival of breeding. Several deputations were unable to secure horses, at least the type that was in their eyes. Those with size and substance, well coupled and smart and strong under pinning were most sought after. Very few men are now giving attention to frills and fancies that have half ruined the breed in the past. A horse is needed to overtake an economical day's hard work on the farm or on the street. The days of fancy points are gone. It is utility now all the time."

* * * * *

ALL IMPORTED FOOD UNDER CONTROL

An Order made by the Board of Trade and published on March 21st prohibits the import of all food stuffs, including feeding stuffs for animals, except under licence. The only exceptions in the application of the Order will be in respect of wines and spirits, fresh and cured fish, and live animals. This measure has been decided upon to unify the control of the trade in imported food stuffs. The more important food stuffs are already controlled by the Ministry of Food, but some are not at present subject either to import licensing or control. It has now been decided that the Ministry of Food shall take control over food stuffs generally and to complete the scope of the control the Board of Trade is making the new Order.

* * * * *

NEW FOOD PRODUCERS' COUNCIL

Addressing the opening meeting of the Domestic Food Producers' Council recently, Sir Reginald Dorman-Smith, the Minister of Agriculture, said that although the food position of this country is good, we must not be lulled into a false sense of security. We must make our arrangements on the assumption of a long war and assess our difficulties accordingly. The farmers, the professional growers, are giving yeoman service, but just as our professional fighting forces must be reinforced in wartime, so must the professional growers be reinforced now by an army of allotment holders and gardeners. The immediate task is to enlist that army in the battle for production so that they may, by their own efforts, provide a substantial contribution towards the national food supply. Many of them will need guidance as to what to grow and how to grow. Whilst there is no danger of producing too much food in this country, it is possible to over-produce a particular kind of food. He exhorted the Council to look ahead and to plan against possible contingencies.

The Council, which has been set up under the Chairmanship of Lord Bingley to assist and advise the Minister of Agriculture in the campaign for increased food production in allotments and gardens, then proceeded to the election of separate Committees to consider the various aspects of their work, for example allotments and gardens, poultry and rabbits, and arrangements were made for meetings of these Committees immediately after the Easter holidays.

* * * * *

POULTRY FOOD SUPPLIES

Lancashire Utility Poultry Society have received from the Ministry of Food the following letter in reply to a resolution passed at a poultry-keepers' protest meeting at Longridge:—

"There appears to be some misconception regarding the statement made by the Minister of Food in the House of Commons on January 25th. His statement that two-thirds of normal requirements would be available for January and February referred to imports of maize, maize products, barley and offals, and had no connection with the supplies of other feeding stuffs and wheat, which is one of the main ingredients of poultry food.

"The livestock policy of the Government," the letter continues, "as laid down by the Ministry of Agriculture, gives preference in the matter of supplies to dairy cattle, fat cattle and sheep, and the brunt of any shortage must therefore fall more heavily on pigs and poultry. Poultry-keepers who depend mainly on imported cereals to feed their birds were strongly advised to make a rigorous culling of their flocks unless they were in a position to obtain alternative supplies of feeding stuffs. This is a position which is likely to continue."

* * * * *

AGRICULTURAL BOTANY

The annual report of the National Institute of Agricultural Botany for the season 1938-39 was issued recently. Much of the Institute's work concerns the trial of new varieties of crop plants. At a time when high production per acre is a question of more than usual importance, the Institute's tests of the ability of certain varieties of wheat to respond to high levels of manuring without lodging are of particular interest. The report indicates that seed of a carefully purified stock of Spratt-Archer barley and of a selected high-yielding strain of Rivet wheat have been recently made available to the seed trade. The report refers chiefly to the pre-war period, and since its publication the institute has issued special war-time editions of leaflets on cereals for spring sowing, potatoes, sugar beet, and mangolds. Copies of these leaflets and of the report can be obtained, free of charge, on application to the Secretary of the Institute, Huntingdon Road, Cambridge, or to any county agricultural organiser.

* * * * *

THE SUPPOSEDLY STERILE SYRINGE

The great significance of the injunctions contained in the following article, reproduced from the *British Medical Journal* of January 20th, will not, we feel sure, be lost on veterinary surgeons. Too great care cannot possibly be taken in ensuring the sterility of the hypodermic syringe, as is made clear by the investigations into the important disaster among human beings which have recently been made as mentioned in the text of this editorial. We hope to print a special annotation on this subject later.

"The widespread use of spirit as a disinfectant, particularly for syringes and scalpels, is a perpetual cause of disquiet to those familiar with the bactericidal properties of alcohol. It is totally incapable of destroying bacterial spores, and from time to time there are records of gas gangrene having been produced by instruments supposedly sterilised by it. So far from being able to kill spores, spirit as used for surgical purposes not infrequently contains living ones. R. Regamey,[1] who has investigated this subject from several points of view, collected 13 samples of spirit in which syringes were being kept in different university clinics in Berne and was able to cultivate bacteria from 12 of them; in one

[1] *Schweiz. med. Wschr.* (1939.) **69.** 874.

case the organism found was a pathogenic *Cl. welchii*, although several injections had been given with syringes left in this sample without ill effects. He also describes a series of experiments which show that the spores of both aerobic and anaerobic bacteria, including all the principal pathogenic species, are capable of surviving in alcohol for periods measured at least in months. It is perhaps less generally known that even non-sporing bacteria are resistant to alcohol under certain conditions, and that these conditions correspond to some of those in which spirit is used as a disinfectant in surgery. Endless experiments illustrating this have been performed in the past, but Regamey's results will serve to draw fresh attention to it. When *Bact. coli* was added to the alcohol in the form of a broth culture it was destroyed within 15 seconds by all concentrations of alcohol between 50 and 99 per cent., and within one minute by 40 per cent. On the other hand, when the culture was dried on silk threads and these were placed in different concentrations of alcohol, only 50 per cent. and 60 per cent. sterilised the thread in one minute; 70 per cent. took three minutes, 80 per cent. 15 minutes, while in 90 and 99 per cent. the organisms survived for 24 hours. Similar results were obtained with streptococci and staphylococci, except that the optimum concentration of alcohol for killing the latter was somewhat higher. These experiments illustrate again the fact that pure alcohol has very little bactericidal activity; it requires to be diluted with water to become effective, doubtless because it cannot penetrate the bacterial cell except in the presence of water. To place dry instruments in undiluted spirit is, therefore, not to sterilise them; the concentration used should preferably be about 70 per cent. How often is this dilution actually carried out? It may be added that for the storage of instruments liable to rust, spirit so diluted would be unsuitable. It may well be asked why, if spirit is so poor a disinfectant, infections traceable to its use are not more common. The same question recently arose in these columns in a discussion of sterilisation by heat; it is well known that boiling cannot be depended on to destroy spores. So far as syringes are concerned, the probability is that in normal use they rarely become dangerously contaminated, and if they are employed only for the injection of sterile medicaments, and are otherwise safeguarded from contamination, to suggest that they should be autoclaved before every occasion of use is no more than a counsel of perfection. It is as well, nevertheless, that the limitations of spirit should be more generally understood in order that it may not be depended on in circumstances which demand more effective methods.

"Knowledge of the bacterial pitfalls of hypodermic injection receives an important addition in the paper of J. W. Bigger, J. W. S. Blacklock, and H. J. Parish on page 79 of this issue of the *Journal*. Their masterly analysis of the facts and possibilities in the recent Irish case falls into two parts: the items of proof that the living tubercle bacilli which were undoubtedly injected with T.A.F. into a number of children could not have been in this material as supplied by the manufacturer, and experiments designed to discover and illustrate how contamination could have taken place at a later stage. Under the former heading it was established that 0·5 per cent. phenol, the preservative used in this and many other materials, will kill tubercle bacilli gaining accidental access to it within a week, and that these and other bacteria do not survive long even if they are present on a rubber cap before it is waxed. The suggestion that the material used was in fact a suspension of tubercle bacilli and not T.A.F. at all was easily disposed of by showing that such a suspension would have contained enough tuberculin to produce a violent local reaction, whereas no such reaction was observed. The experiments connected with the alternative possibility—that contamination took place during the use of this product—are of great practical significance. It was found that a minute droplet of tuberculous sputum on the *outside* of a needle with which the whole contents of a 25 c.cm. rubber-capped bottle were withdrawn by six successive punctures of the cap infected every dose so obtained. This experiment shows not only that when one is dealing with material containing bacteria a little goes a long way, but that the comfortable idea of contamination being wiped off a needle by passage through a rubber cap is entirely ill founded. Similar contamination of the plunger of the syringe also inevitably infected the contents of the bottle, and surface contamination of the rubber cap could be conveyed by the needle to the interior. Perhaps the most striking experiment of all is that in which the interior of a hypodermic needle was infected with sputum containing streptococci and repeatedly immersed in alcohol and washed through with both alcohol and ether; in spite of this treatment, which corresponds to that often accorded to syringes in practice, it delivered 28 successive doses of T.A.F. each containing living streptococci. This experiment undoubtedly illustrates another defect in the action of alcohol: it has no power of penetrating material such as mucus. Accidental contamination often takes the form of a dried film of mucus, pus, or infected blood, and on such a film, however minute, neither spirit nor ether will act effectively. Although these investigations have revealed nothing new in principle, in the precision and far-reaching implications of their detail they are not only new but highly instructive and gravely disquieting."

* * * * *

THE ANTIMONY TREATMENT OF KALA-AZAR

Leishmaniasis is of considerable interest to workers in tropical veterinary science and the following review, contributed by Sir Leonard Rogers to a recent issue of *Nature*, of the treatment of human kala-azar is therefore worthy of notice.

"The progress during the last quarter of a century, due to many workers, in the treatment of the deadly kala-azar of north-east India and the Mediterranean basin has not attracted the attention it deserves. The epidemic form spread 200 miles up the Brahmaputra Valley in the last two decades of the nineteenth century, with a case mortality of 96 per cent., and it caused a reduction of 31·5 per cent. in the population of the Nowgong district in one decade. In 1890 G. M. Giles incorrectly reported kala-azar to be due to hookworms; in 1897 L. Rogers failed to differentiate the fever from malaria, but established a house or site infection, which enabled Dodds-Price to stamp it out of tea estates. The extension of the epidemic to the east was thus checked for two decades, until the influenza outbreak of 1918 caused kala-azar to break out again in the Sibsagar district.

"In 1903 Leishman and Donovan independently discovered the human stage of the causative protozal parasite (*Leishmania donovani*), which Ronald Ross called after them when the flagellate stage was discovered by culture by Rogers in 1904. Work in the Calcutta Medical College hospital also proved that the malarial cachexia of Twining (1835) is nothing but a sporadic form of kala-azar. The very similar *Leishmania tropica* is the cause of oriental sore, and it was the discovery in 1913 by Vianna in Brazil of the effectiveness of tartar emetic intravenously in that infection that led to its successful trial in the Mediterranean in infantile kala-azar in Sicily by Cristina and Caronia reported early in 1915. Rogers immediately reported that he had independently obtained good results with tartar emetic in the India kala-azar after trying other antimony preparations, and in October, 1915, both he and Muir published their results. Further trials showed that both sodium-antimony tartrate, and a colloidal solution of antimony sulphide, made by Fisher of the Madras Educational Service, were equally effective and rather less toxic than the potassium salt.

"This important discovery came in time to enable McCombie Young to control the Sibsagar outbreak through two to three months' intravenous injections of tartar emetic in 80,000 village cases in Assam by 1921, with a recovery rate of 88 per cent., against 4 per cent. in the early Nowgong epidemic. Moreover, the next

census showed no fall in the Sibsagar population. Muir also found that systematic treatment of cases in the Kulna hospital led to the disappearance of cases coming from the surrounding villages, and thus kala-azar became an easily controlled disease, given sufficient medical staff, as tartar emetic is very cheap.

"It remained for the chemists in India and Europe to seek for even more efficient antimony preparations, and they naturally turned to the less toxic pentavalent ones. The first of these was introduced (and patented) by Dr. U. N. Brahmanchari in Calcutta in 1921, under the name of urea stibamine. This proved less toxic and more effective, and it enabled more than 90 per cent. of cases to be cured by intravenous injections within a few days, although so late as 1928, R. N. Chopra, professor of pharmacology in the School of Tropical Medicine, Calcutta, reported this preparation to vary widely in its antimony content and to be uncertain in its composition. In the meantime, von Heyden in Germany prepared a series of pentavalent antimony salts, which were comprehensively tested by L. E. Napier in the hospital of the Calcutta School of Tropical Medicine. Both von Heyden 471, or stibosan, and 693, neostibosan, proved effective, and the latter proved to be the best, with more than 90 per cent. of cures after eight daily intravenous injections. In 1937 a final advance was made by the introduction by Kikuth and Schmidt of solulostibosan, which Struthers and Lin in China, and Yates and Napier in Calcutta, found to be equally effective by the much more convenient intramuscular injections, especially in the young children so frequently attacked by kala-azar.

"The value of neostibosan is shown by a systematic treatment of all the kala-azar cases in a group of Bengal villages by Napier, with a reduction from 121 and 127 in the first two years, to 12 and 3 in the fifth and sixth years and later to nil. Further, between 1923 and 1933, the Assam Government treated more than 300,000 cases, and relied largely on urea stibamine, which was adopted as the preferable drug in 1935. Between 1925 and 1936 the treated cases in Assam fell to one-sixth and the deaths to one-ninth of the former rate.

"Unfortunately for such a poor country as India, the more rapid effects of the pentavalent preparations over the original trivalent tartar emetic is offset by a curative course of the former costing 160 times as much as the latter, according to Napier, who in 1925 found a course of stibosan to cost £2 5s. 0d. and one of urea stibamine £3—a prohibitive sum for poor villagers in India. Napier found the village cases near Calcutta to amount to 33 per 1,000 population, a rate which would give one million in Bengal. The true number must be much less, as in large areas the prevalence is far less than near Calcutta. Owing to their much more scattered distribution in Bengal than in Assam, and the absence of qualified doctors in Indian villages, the problem of treatment in Bengal is more difficult, and requires for its solution a far cheaper preparation, which is equally effective as the pentavalent antimony ones. With such a drug and sufficient village medical staff, kala-azar could be reduced to small proportions.

ADVERTISER'S NOTE

Soluseptasine Price Reduction

Soluseptasine, the only colourless British sulphonamide in concentrated aqueous solution, has been reduced in price. The manufacturers of this product, Pharmaceutical Specialities (May & Baker) Limited, Dagenham, beg to state that 30 c.c. bottles of 20 per cent. solution, packed especially for veterinary use, are now listed at 7s. 6d. instead of 9s. 0d.

Soluseptasine has proved of considerable value in the treatment of haemolytic streptococcal infections in animals and in conditions associated with coliform organisms. These include endometritis, puerperal sepsis, peritonitis, cystitis, septic pneumonia, acute abscesses, etc. Intravenous or intramuscular injections of the preparation bring about clinical improvement in acute mastitis, joint-ill, strangles or pneumonias.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT OF 1937 (PART IV)

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 29th Feb., 1940	23	25	5	1,177	1	2	25	131	48
Corresponding period in ...									
1939	38	42	1	126	3	4	12	50	35
1938	32	33	9	2,867	3	5	5	10	1
1937	25	28	—	—	9	15	8	34	20
Total 1st January to 29th Feb., 1940	104	117	12	2,179	8	15	74	658	269
Corresponding period in									
1939	177	187	26	4,140	14	25	119	209	134
1938	171	177	101	14,559	25	34	66	66	27
1937	119	134	3	262	44	74	82	199	122

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.* herds officially certified as free from tuberculosis, as at 29th February, 1940, was as follows:— England 3,540 ... Wales 8,796 ... Scotland 2,801 ... Total (Great Britain) 15,137

Contents

PAGE

GENERAL ARTICLES:

The Chemoprophylaxis of Trypanosomiasis — LL. E. W. BEVAN 257

The Demonstration of a Peculiar Kind of Coprophagy Normally Practised by the Rabbit — E. L. TAYLOR 259

Coprophagy in the Rabbit ... ... A. EDEN 262

EDITORIAL:

Benevolence and Mutual Defence 263

CLINICAL COMMUNICATION:

Strangulated Inguinal Hernia in a Bull — HENRY TAYLOR 264

ABSTRACTS:

The Fate of Copper in the Blood Stream (Eden, A., and Green, H. H.) ... ... A. T. C. 264

Treatment of Chronic Laminitis (Bolz, W.) J. E. 264

Intra-capsular Fracture of the Femur in a Horse (Dunemann) ... ... C. W. O. 265

The Colic Problem (Gratzl, E.) ... ... J. E. 265

A Double Stomach Tube (Kröll) ... ... J. E. 266

Indications for Passive and Active Immunisation against Tetanus (Gelz, H. J.) ... W. M. H. 266

The Effect of a Phosphorus Deficiency on the Protein and Mineral Metabolism of Sheep (Morris, S., and Ray, S. C.) ... ... A. N. W. 266

The Fasting Metabolism of Ruminants (Morris, S., and Ray, S. C.) ... ... A. N. W. 266

PAGE

REPORT:

Department of Agriculture, Canada: Report of the Veterinary Director General for 1939 W. K. 267

NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY:

Annual General Meeting at Manchester 268

IN PARLIAMENT 269

NOTES AND NEWS:

Higher Agricultural Education 263
Acetates and Sulphanilamide 267
Diary of Events 270
Sir Patrick Laidlaw: The Distemper Investigation at Mill Hill 270
R.C.V.S. Obituary 270
Legal Notes 270
Importance of Restoration of the Livestock Schemes 271
Scheme for Rationing of Feeding Stuffs 271
Augmenting Feeding Stuffs Supplies 272
Scottish Clean Milk Campaign 272
Pharmacy and Poisons Act, 1933 272
The Drug Trade in India 273
The Finns and Their Animals 273
Behaviour of Tsetse Flies 274
German Substitutes for Pharmaceuticals ... 274

CORRESPONDENCE:

Sir John M'Fadyean and the Council of the Royal College of Veterinary Surgeons ... E. MORGAN 274

BISMA-CALNA CREAM

(VETERINARY)

The Combined Carbonates of BISMUTH, MAGNESIUM, CALCIUM and SODIUM

BISMA-CALNA CREAM will be found most effective in the treatment of Acute Gastritis. Ordinary cases of Indigestion are speedily relieved, and in the more serious digestive troubles gratifying results will be obtained by the continued employment of BISMA-CALNA CREAM.

DOSE (for dogs). In acute cases, half teaspoonful to one tablespoonful, according to size and breed, every two hours; later reduced to twice daily.

PRICE **1/6** per lb. Winchesters **1/4** per lb.

CHEVALIOD

A safe and reliable Ointment containing Iodine. Non-irritating and non-desquamating. Excellent for the treatment of Glandular Swellings and relief of pain.

5/6 per lb. 7 lbs. **5/-** per lb.

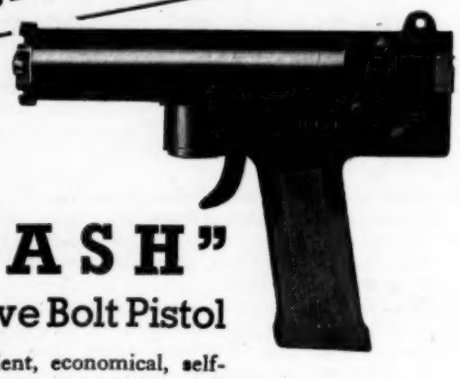
JOHN RICHARDSON & Co., Leicester, Ltd.

Manufacturing Chemists.

Established 1793. **LEICESTER.** Incorporated 1891

LIBRARY
Agricultural & Mechanical College of Texas

A.R.P. The HUMANE DESTRUCTION OF CATS AND DOGS



The "CASH" Captive Bolt Pistol

Safe, efficient, economical, self-contained and as easy to carry as an automatic pistol. Equally suitable for any animal—including cats and all sizes of dogs.

Recommended and used by the R.S.P.C.A.

Full particulars from the sole manufacturers

ACCLES & SHELVOKE LTD.

ASTON BIRMINGHAM · 6

TRADE MARK **'HYPOLOID'** BRAND

(VETERINARY)

TRADE **'INFUNDIN'** MARK

PITUITARY (POSTERIOR LOBE) EXTRACT

A sterile, stable extract, prepared from the carefully-separated posterior lobe of the pituitary body.

Causes contraction of the uterus.

Particularly valuable in cases of uterine inertia in toy-breeds and bull-bitches.

Rubber-capped bottles of 10 *c.c.*

Literature to Veterinary Surgeons on request

BURROUGHS WELLCOME & CO.

V 282 LONDON COPYRIGHT

JOINT-ILL (NAVEL-ILL) **IN FOALS**

For the prevention and treatment of this disease, we issue a reliable polyvalent serum and vaccine,

'ASTIBULIN'

and

JOINT-ILL VACCINE

The Serum, 'Astibulin,' is injected into the foals either as a preventive or as a cure. The vaccine is used prophylactically in the dams only.

NOTE: *Astibulin contains antitoxins as well as antibodies, hence its extraordinary efficacy.*

BAYER

PACKINGS

ASTIBULIN (SERUM)
Bottles of 50 c.c. and 100 c.c.

JOINT-ILL VACCINE
Ampoules of 10 c.c. and bottles of 15 c.c. and 50 c.c.

BAYER PRODUCTS LTD., AFRICA HOUSE, KINGSWAY, LONDON, W.C.2